The Journal of the
American Medical Association
Published Under the Auspices of the Board of Trustees

Vol. LXI, No. 8 CHICAGO, ILLINOIS AUGUST 23, 191

THE TEACHING OF THERAPEUTICS*

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To heal has ever been the function of the physician. Therapeutics is so much older than pathology that it *is but natural that the latter should have had difficulty* in having its tenets promptly and fully recognized in the treatment of disease. Empirical principles die hard, for they have developed by that long trial and struggle —that "survival of the fittest"—that speaks for permanency. *The relief of pain by heat was ages old before* the seat of pain was located in the nervous system. To the man with the pain the attendant with the hot *stone has always been preferable and always will be* to the man who is content with a knowledge of the *cause of pain, its probable duration and its significance* from a pathologic point of view. It is but natural that *the man with the knowledge should show contempt for* the man with the hot stone, and more natural still that the sufferer should sympathize with the one who brings *speediest relief. Thus, with the growth* of medical science, therapeutics has suffered from neglect on the *one hand and overemphasis on the other.* The development of schools of medicine with their various methods of treatment has been a blight on medical growth, both scientifically and sociologically. The last twenty years has done much to give us a practical and in some instances a specific therapeusis for many conditions, and it is clear that the day of schools is passing. Even *those schools* of therapeutics that are practically a religion to their adherents are showing signs of disintegration. *The sin of nihilism toward drugs* in the name of science delayed but will not prevent the early *coming of the day of rational therapeutics based on* sound investigation, careful observation, critical selection and general principles broad enough to incorporate the essential and the useful of all forms of healing.

The present teaching of therapeutics is in an unsatisfactory condition. *The dead hand of the past has* nowhere else in medicine thrown its heavy shadow so far across the path *of progress and growth. The old* prejudices are among us, both within and without the medical profession. We must free our minds from passion, bias, the spirit of controversy and seek for the truth and seek to teach it. We must welcome and adopt all that is worth while in the various schools and make it a part of medical science. It is possible now to extract the kernel of truth from most *systems of healing.* We must do so or we *delay the hour when medicine is to take fully her noble place in the everyday* life of all living men and women.

The prime essentials of all therapeusis are two: first knowledge of the conditions treated and their usua course; and, second, a sympathetic desire to give relie and a knowledge of how to do so. The physicians— and there are many of them—whose minds stop working when a diagnosis is made are the best friends o the cult and the quack. The only way to teach therapeutics is to practice it under the eye of the student Can anything *be more deadening and disheartening to* the student than to take notes from the enumeration in a prosaic lecture of the various drugs "good for certain complaints," with their various doses? The absurdity of such teaching is now becoming generally recognized. In some institutions the historical element which is such a strong factor in hampering our medical schools, still separates medicine and surgery from *therapeutics. They must all go together* and grow together. With increasing scientific thoroughness treatment will forge again to the front in the art of the physician.

Pharmacology has gained a firm hold in medical instruction. It must not fail to extend its domain to *the bedside, to become a part of the life* of each and *every teaching clinic.* It must be taught so that dog experiments will be seen from the viewpoint of man rather than that drug effects on man shall be looked at primarily from the standpoint of the dog. Just as the clinical observer is again beginning to have his day in scientific medicine, so the value of bedside pharmacology is being increasingly recognized. Practically, it may be said *that the modern teaching of therapeutics* should concern itself with a choice from that great *hodge-podge, known as the Materia Medica,* of the useful and the usable; with a study of practical pharmacology, *based on physiology; with bedside instruction in pharmacology* and therapeutics as a distinct part of medicine and surgery; *and with the adoption and adaptation* of all that is worth while in the various systems of medicine. The physiologic effects of *hyperemia are much alike whether induced* by a diffusible stimulant, a mustard pack, a hot bath or general massage. We should teach the student *the significance of the hyperemia* and show him the various methods by which it may be induced. He should understand that the osteopath, the masseur, the hydrotherapeutist, all may obtain therapeutic results even if their knowledge is crude, their logic poor, their theory unscientific. They may *lack that first* prime requisite, knowledge of disease process and power of diagnosis, but they make up for it in *the minds of the ill* by *their* assiduity in *that* second essential, the sympathetic desire to be helpful and the willingness to work for results. We must cultivate this latter in our coldly analytical laboratory students, when they reach the clinic; or, as physicians, they will find that their superior knowledge is not a sufficient magnet to draw patients to them from the hands of the drugless healer and the faddist.

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* Chairman's address before the Section on Pharmacology and Therapeutics of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

Drugless healing is a reproach to medicine. It should never have come into being as an entity. We should not be so associated with bottles and evil doses that the prescription is recognized generally as the badge of our profession. The teacher of therapeutics should be the teacher of medicine and of surgery, and as such he should demonstrate to the student something of the scope of the possibilities in the relief of the sick. Bier's hyperemia, the use of oiled silk in dressings, the after-care of a patient who has been operated on; the intelligent use of the ice-bag should be taught by the surgeon just as the use of the mustard-plaster, the cold sponge-bath, the administration of digitalis and of calomel should come from the teacher of medicine.

When physical therapeutics is taught by clinicians from the sound basis of physiology and pathology in all of our medical schools, the problem of drugless healing as it is practiced outside of the profession will no longer exist. The teacher must remember that a cannon-ball rolled over the outside of the abdomen is more satisfactory to many constipated patients than a cathartic pill inside, and that a dietary cure is even more gratefully received. Skill in the use of drugs and other forms of treatment can only come from careful observation. One physician succeeds where another fails, and often with the same remedy or the same method. We all know the splendid effects of calomel on the patient who announces that he cannot take it, because Dr. S. has tried it either without success or with subsequent evil results. A few good drugs, well understood, are of more value than a whole medicine-chest. The man who has been taught the intelligent use of such remedies as opium, quinin, castor oil, calomel, the salicylates and digitalis need not fear as a competitor the drug-clerk who later studies medicine and who has everything on the shelves at his fingers' ends.

Day-to-day instruction in the use of drugs and in their careful selection is required of the clinical teacher. A few minutes in each bedside or outpatient clinical conference will bring out the main points. This is vital, since the majority of the text-books on therapeutics are merely well-arranged cemeteries filled with records of treatments that have gone before. They attempt to list most of the drugs that have been used for any given condition and are apparently satisfied with the mention of any form of treatment if they can put the responsibility on some one else. Selection is just beginning to be recognized as the main function of the author of such a text-book. If he cannot intelligently choose the wheat from the chaff, how is the young physician who looks to the book for guidance to be able to do so? The student should be taught to determine the leading symptoms demanding treatment and to care for them promptly, provided they are not needed as guides in diagnosis. Along with this should go a thorough instruction in the effects of each drug given and in its possible action on various bodily functions and the method of the correction of these, if necessary. Physicians and laity alike are too prone to consider subsequent disease symptoms as due to drugs previously administered. Pharmacologic bedside studies alone will give the proper judgment in the interpretation of such conditions.

We must also recognize that elegance in pharmacy has its place in therapeutics. The modern stomach cannot be ignored. The psychic element in gastric function holds for drugs as it does for foods. And we must not lose sight of mental therapeutics. Milk-sugar mixed with hope and encouragement is sweeter than saccharin to many a sufferer. Reassurance is often as comforting as opium and has fewer after-effects.

My plea, then, is for a broader and for a narrower point of view in the teaching of therapeutics; a broader one to include all that is essentially sound or that can be scientifically tested regardless of origin or school, and a narrower one to exclude all that is outgrown, that savors of polypharmacy and that smacks of the quack. It is further for pharmacologic instruction of the student with the dispensary patient before him, or at the bedside and for a firm union of the teaching of therapeutics with all forms of clinical instruction.

Sacramento and Webster Streets.

THE FUTURE OF THE MEDICAL MAN*

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Gentlemen of the Graduating Class:

Need I tell you how I appreciate the honor that has been conferred on me by your dean and the medical faculty of Rush Medical College by asking me to address you this afternoon at this, the culminating moment of your university career? But let me confess to you that with the honor comes the sense of heavy responsibility. From him to whom much is given much is also asked. Time and again in the years that are to come, this graduation ceremony will recall itself to the minds of each one of you as marking an epoch. It would be well could I utter words which should impress themselves in such a way that they remain with you as part and parcel of the event, words memorable for themselves as well as of the occasion; but if the utterance of such words is given to few, very few, of us, it is proper that what I say should be not unworthy, that it should attune itself to the occasion. It would be out of harmony with the event were I to seize this opportunity to deliver my message as a pathologist, and enunciate my views concerning some moot point in medical science; were I to read you a lecture on advanced pathology.

I must perforce strive to utter thus that which will appeal to each of you, that which will be helpful. During the last few years you have been satiated with lectures on special topics; to-day it is for me to strive to sum up the significance of all this teaching—all this education—in one comprehensive address. For four years—aye, and for long years previously—you have been preparing to enter the practice of medicine; to-day you are at the very entrance of that practice, at the threshold; to-day the university gives you its testamur. Each one of you must be asking, "What of the future?" Now, I am far from wishing to inflict a sermon on you, but at this particular moment I do but reecho the thought that is uppermost in all your minds. All the work of all these years has led to this moment, and now what next? What about the years that are to come?

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* Commencement address at Rush Medical College, Chicago, June 12, 1913.

NATURE OF TRUE KNOWLEDGE

Well, gentlemen, I trust that I shall not shock you too much when I lay down that you know next to nothing; you are but at the beginning of knowledge. I say this knowing perfectly well that there is no period in the whole of a man's existence when he feels so replete, so distended, with medicine as immediately following on the final examination and graduation. I speak knowingly, for I have been there myself. But, gentlemen, this sensation is comparable to that of the woman who, suffering from flatus, imagines herself to be in the latter months of pregnancy. It is an equally false conception. In the first place, in a four-year course, however well conducted, your teachers can have given you but the basal outlines of their respective subjects. We know how small a portion of one subject we can instil into you in the brief months during which you sit under each one of us. That is the reason why we are constantly striving to lengthen our courses—why each year you are made to feel more and more the heavy burden of the training. The better the teacher, the more, I think, his conscience pricks him for the inevitable deficiencies of his curriculum; and, paradoxically, I may add, the simpler and more elementary he makes his teaching, realizing that, as his subject cannot possibly be covered, his time is best employed in laying down secure foundations on which later the student may build a fair and seemly superstructure.

In the second place, true knowledge consists not in cognition, in the possession of a store of facts, but in the capacity to utilize them. You may be chock full of medical data, but until you have learned to employ these data, until you have tested their value in practice, you are but, as it were, sucklings in medicine. Heaven preserve the patients of the man who passes straight from graduation into private practice! Great as is the *vis medicatrix naturae,* that imposes all too heavy a strain on it. This only would I say, that the vast increase in the practical work of the course that has been brought about during the last generation should make the student more secure of his data, more capable of using them with advantage; but notwithstanding the increased contact with the actual patient during the last two years of the course, which in comparison with your predecessors you have been afforded, I still doubt whether to-day the student on graduation is as capable of launching out into the world, is as serviceable to his patient, as was the product of the days of apprenticeship forty years ago. When it comes to a matter of differential diagnosis, he may be vastly his superior; but in knowledge of treatment of the patient as distinct from his disease, he is as vastly inferior. Wherefore, I trust that one and all of you before me have dedicated yourselves to at least a year of hospital internship, that you may learn the art as distinguished from the science of medicine.

That learned old physician, John Caius, physician in succession to Edward VI, Mary and Elizabeth (at whom, indeed, Shakespeare seems to have poked fun), when he refounded the college which bears his name in Cambridge, with that love of symbolism not uncommon in his generation, built three gates. The gate of entrance with its little wicket (now significantly removed as a relic into a back garden) he called the Gate of Humility. In the midspace of the college, supported on either side by the students' rooms and college buildings proper (which on their foundation stone were dedicated to Knowledge) was and still is a wide and lofty archway, of almost Roman simplicity and severity, with the inscription "Virtutis"—the Gate of Virtue (and of Wisdom). At the farther end, leading out to the public schools, where the university confers its degrees, is the exquisite and richly ornamented Gate of Honor, about the earliest example of Italian Renaissance architecture to be found in England. All of which is a parable. I for long wondered why Caius when he made this gate so beautiful made it so diminutive. On first thought, one would expect something of goodly size, suggesting a triumphal arch. But no, the passage through it is narrower and lower than that through the old gate of entrance; the Gate "Virtutis" would as it were swallow several of it. Did he not here intend another parable—that the man who completes his course with honor should pass out, out of the college into the wider world, even as he entered college, with becoming and even greater humility?

You are thus at the beginning of medical learning, not at its end; but if true medical knowledge and wisdom come with practice—if you as medical men are to be students all through the days of your active life—how are you to comport yourselves toward your profession?

MEDICINE AS A BUSINESS

Here on the borders of the West, I feel some delicacy in entering on this subject; but at the same time, for the love of my profession, I recognize the necessity that I should speak frankly and urgently. For what in the East we call "the Western spirit" has entered into medicine. I protest against this appellation: this spirit is neither Eastern nor Western; it affects the whole continent; it affects the modern world in general; it is the spirit of the age. We live in an age when a man's status is determined by his apparent wealth. That is inevitable with progressive democratization. Worth may make the man and the want of it the fellow. The more philosophic we are, the more freely we admit with the poet that all else is "leather and prunella"; but notwithstanding and nevertheless, save in the most outstanding cases, worth carries with it no social recognition—it is imponderable. Man—and woman—demands some standard of comparison, and if relative rank be largely abolished, there is nothing to fall back on but worldly possessions, whence it is that, whereas of old the physician, and his wife, had a status dependent on his profession—whereas he ranked next to the lawyer, and as a professional man took precedence of those engaged in commerce—to-day he who has scooped his millions from the manufacture of a quack remedy is accounted the greater, and takes without shame the upper seat; and almost perforce the physician is driven to strive after more than a mere modest competence, if he is to be of standing in the community.

Therefore the student entering medicine to-day is apt to have before him something not included in the hippocratic oath. Certain it is that an increasing proportion of medical men is more concerned over the means of improving its balance in the bank than over the means of improving the health of its patients, and regards social success as more to be considered than professional capacity. What is more, other influences are leading in the same direction. It is to the credit of the young manhood of this country and this generation that it realizes as never before its duty to make its own way in the world. To me there is something splendid in this impatience of the yoke of indebtedness, in the determination to repay at the earliest moment, whether to parent or family friend, the heavy cost of the medical course. Often, it is true, I am torn between admiration and regret. I see men who [illegible] convinced, [illegible] uld become leaders in the profession could they devote a year or two to advanced medicine and research, men who would thereby reap some fifty, some one hundredfold in the years that are to come, shortsightedly, as it seems to me, let slip the opportunity and consign themselves to mediocrity in their keen anxiety to be out of debt and independent. I think that in such cases my admiration predominates, but my regret is also poignant; but such men inevitably begin practice with the need to make a pecuniary success almost too prominently and constantly before them.

Then, again, it is but human to hold that there be a certain ratio between the amount of capital invested in any enterprise and the return yielded thereby. We may regard the time and money expended on his education by or on behalf of the medical student as the equivalent of capital invested. Within a generation—within little more than half a generation—this requisite capital has increased to an extraordinary extent. This fact was brought rudely before me within the last few days, when discussing with my old friend, the dean of the medical faculty of the University of Minnesota, Professor Wesbrook, the developments that have occurred in the seventeen years during which he has been connected with that school. In 1895, when he joined the faculty, all that was demanded of the student was a course of three years of seven months each; in all, twenty-one months' instruction. Soon that was raised to four years of nine months—thirty-six months—more than half as much again. To-day, before the degree is granted, the university and the state demand six years of nine months (two years in arts and four in medicine), and one full year of twelve months in a hospital approved by the university. The three years of 1895 have given place to seven years, the twenty-one months to sixty-six. The time capital has been more than trebled, and the same must be true of the pecuniary outlay; and when we compare the difference in the quality as well as in the quantity of education afforded, when we realize the quality of the output, is it to be wondered at that the physician of to-day should demand a higher return?

MEDICINE AS A PROFESSION

And yet, gentlemen, while admitting that there is an evident increase in the number of those medical men who regard their work as a business, the noble fact remains that to-day as in all ages the lure of medicine is such that the majority follow it from pure love of the work and of their fellows. The majority still devote themselves to it with the old spirit, caring little about the monetary return so long as they are secure of a decent competence; they regard it as what it is—a profession and not a trade. Their life work is to bring healing to the sick, to make the weak strong, to soothe the suffering, to help their kind. This to them is before all else. And here, in aiding poor humanity, the physician's work approaches the divine. It is at least suggestive that, as Dr. James Douglas has pointed out, of the twenty or twenty-two miracles recorded as being performed by the Founder of the Christian religion, no less than seventeen are acts of healing, of raising the sick, of restoring sight to the blind, of curing the palsied, of so-called casting out of devils, or restoring those apparently dead to life. It was through this power in healing the sick that Christ impressed his divinity on his generation. Whatever our faith or want of faith, this must strike us as most significant. "From the Most High cometh healing."

Indeed, this same spirit of devotion to the main object of our profession has been shown in our generation more than in any other period of the world's history. In every center of population throughout the world, we have presented groups of medical men giving their whole time and all their energies to the investigation and perfection of methods not of cure but of prevention of disease. We can proudly state that ours is the only profession which, were the making of money its prime object, with open eyes and set purpose indulges in the suicidal policy of endeavoring consistently to reduce its means of sustenance. Our leading thinkers, our leading investigators, have before them the banishment from among us of the vast array of infectious diseases, and in their efforts have the loyal support of the whole profession. Thus in the body corporate of medical men, as in the body of each individual being, there is this constant war between opposing motives.

EVOLUTION OF MEDICAL IDEALS

Perhaps I have not been sufficiently following the biologic literature of the last few years, and what I am about to say is already a commonplace; but after a study of mendelian heredity I have wondered why no one has come prominently forward to demonstrate the why and wherefore of progressive evolution and its inevitability in the terms of dominant and recessive. So far as I can see, in every mating it is the positive acquirement or quality that is dominant; the defect or absence of the same that is recessive. Thus hairiness is apt to be dominant to smoothness or want of hairs; the presence of eye pigment to absence of pigment; with the result that if there be mating between the possessor of a dominant quality and a possessor of a recessive quality the offspring of the first generation all present the dominant quality. There it is, although not absolutely fixed; the recessive character is also present but latent; and if two of this generation mate the chances are that the recessive quality will show itself, but only in the proportion of one to four. Three out of four will present the dominant, the added quality; in one of the three firmly fixed, in the other two with the recessive quality also present but latent. In this way, you see, the dominant quality, acting on the majority of individuals of the strain, gradually becomes predominant, and there is the greater likelihood that if some further positive feature be acquired this will fall to the lot of some member of the major class; and so as the ages progress the inevitable tendency is to a steady increment of properties—to, in short, progressive cumulative evolution.

So it is with all true progress: it is cumulative; it has to be. Two centuries ago, beyond certain crude ideas regarding disinfection, preventive medicine was almost non-existent. The function of the physician was only to cure. Then this added idea of prevention showed itself in some of the greater men of the profession and steadily with successive generations, being a positive acquirement, it is becoming more and more a fixed principle of the profession.

Whither is it leading us? To this, it seems to me: The time is on us when the physician must make his livelihood, not for the cure of the patient but for preserving him in health and preventing him from falling sick. There will always be with us what may be termed physiologic medicine, the caring for women in normal childbirth, for the very young and the very old; always traumatic medicine or surgery; always a certain not inconsiderable amount of family medicine—for Johnnie will indulge in green apples so long as there are Johnnies and apple-trees, and will suffer in consequence. Nay, more, I do not in the least imagine that we shall gain ascendancy over pathogenic bacteria as a body. I feel convinced that if we drive out such diseases as tuberculosis, typhoid and scarlet fever, we shall weaken the general bodily immunity. I think that we are realizing more and more that a man does not so much escape the ordinary infectious diseases because he has a strong inherited immunity, as because, by good fortune, he has time and again been exposed to mild subinfectious doses of the virus, and in neutralizing these has gained such immunity that later he is able to resist doses which would otherwise set up acute disease; and doing this that he raises not merely the specific but also the general resisting power of the organism.

If, therefore, we eradicate certain specific germs which to-day are widely spread, we are in danger of lowering the general resistance to disease; our bodies will not be so well educated to resist, and we shall be apt to succumb to microbes and diseases which in our present state are incapable of attacking us.

It follows that I imagine no Utopia from which infection will be banished; only a state of generally improved conditions of existence in which the exanthemas and the severer infections will be much reduced in their incidence, and the active curative work of the physician will be definitely reduced, the preventive work as definitely increased. Now, although the bacteriologist, detecting tubercle bacilli in the milk of a cow, by bringing about the compulsory slaughter of the beast prevents, it may be, a series of infants from succumbing to tabes mesenterica, that bacteriologist—virtuous as has been his action—cannot bill all the families of a particular milk-route for what he has saved them; cannot say to the parents, "The estimated value of your child's life to you and to the community has been officially estimated at so much, the chance that it would become infected from this particular cow was such and such, wherefore you owe me so much." The idea sounds absurd. But, as a matter of fact, the bacteriologist has accomplished all this, and if the individual cannot be asked to pay, it is for the community to show its appreciation. The more medicine becomes preventive, the more incumbent does it become on the community and the state, rather than on the individual, to subsidize the medical man.

I am no socialist, far from it. To me the doctrine that all men are born equal and are equal is as repugnant as it is manifestly false. How could we hope for progressive development, for the advance of our race, if all were at the same dead level; and if, notwithstanding the improvement in the individual, brought about by wise course of life in favorable surroundings, his offspring were after all only equal to that of the individual injured by unfavorable surroundings? The idea is unnatural, is contrary to the knowledge of evolution. It is on the face of it idiotic to maintain that the child born with the stigmata of congenital syphilis is equal to the child of sound parentage. That all be given, as far as possible, equal opportunities, that all be given a fair start, is quite another matter. If, therefore, I recognized a likelihood that the conversion of medicine into a public service would reduce all medical men to a common standard, no one would offer more active resistance. But I foresee that it means nothing of the kind. We are thus, I firmly believe, within measurable distance of the nationalization of the medical profession. I want you, gentlemen, to realize this, to face it clearly, and, what is more, to be prepared to help toward its accomplishment, living lives that will at once be a credit and a help to all our body. Such a momentous change should come from within the profession, not be forced on us from without.

I am not alone in this opinion; there are, I feel assured, others on this platform, members of your faculty, who are equally convinced that this has to come.

EUROPEAN PROGRESS IN PUBLIC HEALTH WORK

For what are the signs of the times? We on this continent call ourselves progressive, and we are progressive, but in this matter the Old World is leading the way. It is in no sense derogatory to us of the New World if, busied with the vast task of settling and establishing a continent, older countries across the ocean with greater leisure are far beyond us in certain directions. We here, for example, are still in a medieval condition as regards our Public Health Service. Individual cities, like your own, may be striving valiantly to place health matters on a proper footing; but take the country as a whole, and what do we find? Instead of securing those who have expert training as municipal health officers and paying them well, your ordinary municipalities elect either the youngest and rawest practitioner in the district or the man who has been a failure in private practice, to whom the shamefully inadequate stipend doled out by a grudging municipality is better than nothing. With such incapable minor officials, the state board of health, however capable its higher officials, is constantly impeded in its efforts. Here Germany and England are far ahead. Take the British conditions, which I know best. There every municipality must have its trained health officer, possessing a diploma of public health of an accredited university, and those posts are so well paid that I know from experience that universities have difficulty in procuring the best men to fill their professional chairs in hygiene, because the stipends afforded by the largest cities and more populous counties are so high that the attractions the universities can afford are insufficient. There is thus developed in Great Britain a definite career in preventive and public medicine, which to-day is attracting to it scores of the brightest of our men—a public service with definite grades and opportunities for promotion, with office dependent on capacity, independent of local and party politics, with permanency of tenure and popular respect. Bumbledom, it is true, does not love it, but Bumbledom is forced to submit under fear of such pains and penalties that perforce it cleans up its house and its back yard and reduces its infantile and other mortality.

This, however, as doubtless you all know, has been put into the shade by the further developments of the last few months, marshalled by Lloyd George. It is difficult to arrive at a sober, disinterested opinion regarding Lloyd George, so strong is the feeling he has aroused one way or the other. It seems impossible for any Englishman to appreciate his correct measure. If one can arrive at any judgment from the parliamentary proceedings, say by studying the *Times*, there can be no doubt that those proceedings and the tone of public life in Great Britain have painfully deteriorated since he and his friend Winston Churchill have come to the fore. Doubtless, were I in the old country, with certain innate conservative tendencies, I should cordially loathe him. Seen dispassionately from a distance, he appears to be that rarest of combinations, a ranting demagogue possessed of constructive powers. In establishing the eye and artisan insurance, he was, it is true, only following the lead of Germany, but his insurance against sickness has followed distinctly original lines. Briefly, he said that this payment on the part of or on behalf of the artisan and his family for insurance against sickness led to other obligations. If the government made itself responsible for payment for disability, it must provide the medical attendance, must see that the sick man or woman received due care according to a definite scale; and that this must be provided by the state. Thus to-day in Great Britain there is compulsory insurance against sickness and disability for all those whose earnings are below a certain amount, and in return the government provides medical attendance. The medical men in any district who accept the government terms become in this way servants of the state. The worker, male or female, is given the power of selecting his medical attendant from the panel, and having selected him he is paid by the government at the rate of something under two dollars per year per head. His interest, therefore, is to preserve the health of his clients—the less active sickness there is the better for him and for everybody. There are, I should add, special payments for drugs, maternity cases, tuberculosis, etc., which here I need not enter into.

So, after a sharp and very bitter campaign, medical conditions in Great Britain have been revolutionized. What must impress those who have followed the fight put up by the profession is that our brothers across the water were not opposed to the principle of Lloyd George's measure; on the contrary, they were ready to admit it. What aroused their fury was the way in which the bill was introduced; the way in which they, brought up to glory in their professional independence, were forced to convert themselves into public servants without so much as a polite "by your leave"; were told what should be the registration fee without consultation. To modify slightly an old saying, it was not what Lloyd George did, but the nasty way in which he did it. Wherefore, at first they refused to eat the Welshman's leek, but after it had been cut down somewhat and served in a more acceptable manner they eventually consumed it with fair grace. Now the measure has become law and matters are in process of adjustment. For example, the hospitals, both great and small, in Great Britain as here, have been established and are maintained by the voluntary contributions of the well-to-do. To-day, these supporters of the past are refusing further aid, on the ground that, as the rich are being heavily taxed by the government to meet the expenses of the new state of affairs, and as the government has made itself responsible for the sick poor, it and not they must bear the cost of medical charities, and must either make the hospitals complete state institutions as in Germany, or must afford so much per diem for each patient treated in the wards and in the outpatient clinics. It is doubtful if the government will consent to "taxation without representation"; whether they will pay for hospital maintenance without having a controlling influence on the hospital board. They must, it would seem, eventually obtain this control, and the nationalization of the hospitals must be a matter of the near future.

See what this signifies. The leaders of the profession are on the staffs of the hospitals. Men who have their paying patients among the well-to-do have refused thus far to accept the government contract and enter the public service. These leading physicians and surgeons will find themselves in the position of either resigning their hospital posts (which, when one considers what hospital opportunities and hospital positions signify, appears to me to be the unlikely course), or of continuing to serve, but now as government officials.

THE IDEAL OF SERVICE IN MEDICAL PRACTICE

Surely, therefore, and by no means slowly, Great Britain is embarked on a course that can lead only to medicine becoming a state service, just as are the army and the navy. From what we know of our brothers across the ocean, we may be sure that they will proceed by compromise; that they will be practical rather than logical in their advance. For long there will exist side by side the state practitioners, paid largely by stipend, and the private practitioners, consultants, surgeons, and specialists, paid by fee; but as the public medical service grows in extent it will grow in importance and desirability. There will be grades in the service, with possibility of promotion; valuable hospital and administrative posts to be filled. Inevitably the status of the members of the government service will come to be regarded as superior to that of the private practitioners. Once the world and his wife recognizes this, there will be no further difficulty: the whole profession will lapse into public service. It will, indeed, be exactly as with the army and navy. Your general or admiral, even your colonel or your commander, does not take his place in society and is not esteemed according to his wealth, but according to his position as a servant of the nation.

For this, gentlemen, we must realize: The race for wealth to-day is not a race for dollars; nor, after a certain point is reached, not difficult of attainment, is it a race for what dollars will buy. It is eventually a race for social status. If we can secure this status by other more honorable—or less vulgar—means, it is well for us. It is best for us to rejoice in our work for the work's sake and that alone; but if not all are able to attain unto this standard—and we must remember that ambition is healthy and laudable—then at least we do most good and least harm if, serving our fellows, we serve also the state, and develop a relative rank dependent on capacity and merit; comforted by the assurance that our work well done will bring us sufficient for our comfort, for the due education and maintenance of our family, and for our wife to meet the social enemy in the gate with due recognition. As medical men, what more ought we to need? There will be no socialistic dead level of sameness in such a future. Individual work and capacity will tell, though it will show itself mainly by position achieved and only secondarily by dollars.

This, it seems to me, is the future that lies open to us in this continent. It may be objected that here we have no Lloyd George and no workingman's insurance act to bring about the change. Quite so, but we have other influences. The development of an adequate and well-equipped public health service in every state of the Union is sure to come. And over a large part of the country, especially in the center and West, we have institutions whose influence undoubtedly is working toward the end I have indicated. I refer to the state universities and to the huge bonus which the states through these universities afford to the student who takes the six- or seven-year medical course. Even in institutions like your own, supported by private beneficence, I wonder if you realize that, while you pay what appear to be considerable fees, these fees represent only about half the cost of your education. The other half is a free gift to you from private individuals, and that not for your individual benefit but for the public good. This gift to the medical student, whether by the state or by the philanthropist, can mean only that the public recognizes that good medical attendance is a public need—aye, a public service. It is an indication that the community is prepared to go further—to call to itself an army whose function is to save life, not to destroy.

So, gentlemen, it comes to this, that, despite all the present-day temptations to which I have referred, to-day and in the future as even in the past care must be not for ourselves but for our fellows. If we desire not so much an upper seat in the synagogue as a serene mind and self-respect as the greatest of worldly possessions, let us not trouble ourselves about money-making. With your training, all that is necessary will come to you—you need have no fear.

I happened a few hours ago to come across once more a short address which Rudyard Kipling delivered to the students at McGill University six years ago. I do not think I can conclude better than by quoting some of his words:

> Money dominates everybody except the man who does not want money. You may meet that man in your farm, in your village, in your legislature. But be sure that, whenever and wherever you meet him, as soon as it comes to a direct issue between you, his little finger will be thicker than your loin. You will go in fear of him; he will not go in fear of you. You will do what he wants; he will not do what you want. You will find that you have no weapon in your armory with which you can attack him; no argument with which you can appeal to him. Whatever you gain, he will gain more. . . . If your wealth is necessary for you, for purposes not your own, use your left hand to acquire it, but keep your right hand for your proper work in life.

Gentlemen, may you fare well in your life work.

SURGICAL PATHOLOGY *

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THE LACK OF AND THE NECESSITY FOR THE CORRELATION OF SUBJECTS IN MEDICAL EDUCATION

In the study of medicine each decade finds an increase of prescribed courses in the curriculums of the leading medical schools of the country. Not over thirty years ago instruction in pathology was given by the professors of medicine and surgery. The establishment of the chair of pathology was the first step from the custom of many years. Soon the chair of bacteriology was recognized as necessary, and a little later clinical pathology came into being. These topics came into prominence when an increase in knowledge made them too cumbersome for the professor of pathology and his staff to teach, burdened as they were with the constant increase in details in their own department. This increase in topics was not confined to offsprings of pathology alone, but was happening in all the major subjects. In surgery, there are found gynecology, genito-urinary, orthopedic, and oral surgery, all due to a widened scope and knowledge of the parent subject. These branches are well established in the minds of the practitioner and his patients, as shown by their recognition of the specialist, who is simply the ultrarefinement of the surgeon-barber of the sixteenth century. In his endeavor to be the possessor of the latest knowledge necessary for the best results in treatment, the embryo practitioner found that, on account of the unlimited mass of facts confronting him, he must choose one branch and confine himself to it. The medical schools, in the proper performance of their duty, provided instruction and suitable courses in these topics.

In the old days the professors of the various subjects, even of anatomy, were practitioners, each comprehending what every other professor in his medical school was teaching the students. Thus unity of purpose existed, a distinct advantage, in that the medical student from day to day understood without effort the semiclinical lectures and the relations of one subject to another. It must be conceded that the simplicity of subjects at the time also led to the same end.

Dating from the Renaissance in the study of anatomy and medicine, laboratories devoted to anatomy first appeared. At that period medical schools existed as establishments in relation to the laboratories of anatomy. As each subject in medical education was born, laboratories for each scientific branch were provided, since there were always scientists, especially in medicine, who desired to investigate things for themselves, as well as those desirous of augmenting knowledge by research. Moreover, in addition to the old-fashioned semiclinical lectures, to afford instruction by personal observations in the rapidly developing topics of medicine, laboratories and their adjunct demonstration rooms, were necessary. With the appearance of laboratories and laboratory workers, akin to pure scientists, on the teaching staffs of the various departments, and because the practitioner-instructors properly continued to deal with clinical subjects, two teaching groups were, unfortunately, formed in each medical school.

Because of this tendency of the scientists, wrapped up in the mysteries of the pathologic laboratory, to slip further and further away from the point of view of the clinician, the medical student is apt to be the sufferer. Many pathologists seem to forget that the majority of students who come before them intend to practice after they graduate. The fact that the individual elects to settle down in the enclosed life of the laboratory, deal in pathology, and teach a more or less abstract science indicates his mental attitude. There are many exceptions to this rule and there have been many in the past; however, it is fair to state that the interests of the pure pathologists are not those of the clinician.

On the other hand, with few exceptions, the clinical professors are out of touch with the laboratory. The countless clinical teachers on the staffs of the many medical schools of the country are not aware of what the pathologists of their individual schools know and teach on a given point. Because of this, the student fails, often until it is too late, to realize that he is studying pathology in order that he may have a better understanding of surgical and medical conditions and processes. The pathology that the student absorbs he is apt to carry in a separate niche of his brain, and his surgery and medicine in others, thus not having the study of pathology to assist him to the best advantage in his study of surgery and medicine.

From the point of view of medicine, the instructor in pathology may be presenting to the students gross specimens, among which may be a lung covered by fibrinous exudate. Should the instructor state, "The physical signs the patient has recently shown are as follows . . . and here before you is this beautiful demonstration of their cause," think of the mental picture the student by necessity conjures up when the gross pathologic specimens seem again to be alive before him, as in an actual clinical case. When this point is brought to the attention of the teacher in pathology, he is apt to reply, "That is

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the duty of the professor of medicine; I am expected to teach the abstract science of pathology." At the same time this teacher of pathology will feel that his domain is somewhat encroached on if the professor of medicine attempts the presentation of specimens to exemplify physical signs. If this deficiency in the teaching of pathology is brought to their attention many instructors of pathology reply, "These are but students; after they become practitioners they will obtain these associations of ideas in physical signs and pathologic conditions." If this be true, does not such an explanation intimate that correlation of ideas is always the best aid in learning? The same clinicians and pathologists will state that this or that prominent man was eminent as a clinician because in his younger days he had unusual facilities for doing necropsies, especially on the patients whose physical signs he had known from personal observation. Others may contend that these men possessed superior mental talents. Possibly so; but they directed their talents so that the point in hand was attacked from every possible side.

From the point of view of surgery, a clinical instructor in the routine of surgical teaching may present to the students a suppurative arthritis. At a remote period the pathologic staff of the school discourses in a purely abstract manner on the changes following the repair of abscess cavities, and possibly may mention that abscesses occur in joints. To return to the clinical aspect, the surgeon expounds on the necessity for drainage of the joint to limit as far as possible the toxemia; he may state that the usefulness of the joint will probably be more or less impaired, even speaking of adhesions and the separation of the cartilages. The average student cannot bridge the gap and visualize the actual pathologic changes, logically thinking over the abstract teachings gleaned in the department of pathology. The pathologist, with the almost countless themes that must be covered in the allotted time, cannot pause to mention physical signs, clinical course, and the treatment necessary for each pathologic condition and process that is touched on.

The surgeon, on the other hand, with his mind riveted day after day on the purely clinical side, his time taken up with clinical duties, cannot be expected to give in detail and discuss at length all the vagaries of the gross and microscopic changes occurring and likely to occur from the day of the infection of the joint until healing is complete and the process has reached a quiescent stage. How may such a lack of correlation in teaching be compensated for?

THE RÔLE OF SURGICAL PATHOLOGY

So far as surgery is concerned, the subject, surgical pathology, should be the connecting link in the student mind between surgery and pathology, in order that the student may readily correlate each point as it is presented. Surgical pathology is really a study of the clinical aspect of the pathologic conditions and processes coming directly under the notice of the surgeon, and not matter abstracted from the domain either of pathology or surgery. Surgical pathology, for example, should show the student how a given physical sign in a clinical process may be explained if the pathologic condition is understood.

The importance of this correlation of ideas for the medical student is not universally realized, nor is there any general comprehension of the rôle that surgical pathology should fill in medical education.

THE PERIODS FOR SURGICAL PATHOLOGY IN THE STUDY OF MEDICINE

Surgical pathology should commence as an introduction to surgery and its special branches, at the period when the student is well advanced in his study of introductory subjects, such as gross and microscopic anatomy, physiology, and physiologic chemistry, and at the time when he commences bacteriology and pathology, in order that these given subjects shall be studied side by side. This period is usually reached some time during the second year at the medical school. To round out his surgical course to the best advantage, moreover, surgical pathology should be reviewed in the last year. In the student's introduction to surgery, the subject, at best, is a new field in his education, but after he has had a period of time to correlate whatever he remembers, after he has seen considerable clinical material, attended many operations and followed their subsequent clinical progress, and heard lectures on surgery, he will grasp the subject from a much broader point of view.

TIME TO BE DEVOTED TO THE SUBJECT

To make a lasting impression on the student mind, the introductory course must extend over a considerable period. At least three hours a week throughout the year are necessary, of which two one-hour sessions may be devoted to discussion in the class-room, and one hour to laboratory work or clinical observations.

In the second period, two two-hour sessions of laboratory work for a quarter of the year are sufficient. This time may be evenly divided between the laboratory of the university hospital to facilitate instruction in human tissues, and the college laboratories of surgical pathology.

COURSE IN SURGICAL PATHOLOGY; TOPICS FOR STUDY

The student, during his first period, should read the given lessons in a text-book on surgery and study the pathologic processes in a text-book on pathology; this should be followed by conferences with the instructor, combined with laboratory work and the observation of clinical material.

The course should commence with one of the simplest possible processes and conditions that are departures from the normal, such as a simple injury; for example, an incised wound. The study of this will lead the way to all the interesting phases of repair, bringing in the more and more complicated forms of injury involving the various tissues of the body—skin, connective tissues, mucous membrane, muscle, bones, nerves, vessels, and the parenchyma of the various organs. The student has an opportunity to learn just what the injury does to the living tissues and to observe the pathologic processes and conditions that supervene. The discussion in the class-room must of necessity cover a wide range—gaping of the wound, hemorrhage, exudate (coagulated or fluid), proliferation of tissues, clinical terms, regeneration and repair, ideal, delayed and abolished healing, inflammation, infection, scar tissue, and the interference with function.[1] In other words, much more than the actual study of the repair of an incised wound must be touched on by the students.

Attention is here called to the fact that inflammation as a topic has not been mentioned. It seems to make more impression on the students and to be better understood if the process is treated merely as an incident in all injuries, varying simply in degree. Confusion is thus avoided to a certain extent in the student mind between what the clinician understands by inflammation and what the pathologist teaches.

Under supervision, in the laboratory, a student may make a small incised wound in an anesthetized animal. The entire student section may see the wound gape, and the clinical changes presenting various physical signs may be followed to the termination of the process in repair. Microscopic sections, taken at the various stages of repair following the injury or operative wound, from both animal and human tissues, will serve to illustrate and furnish a basis for discussion of the physical signs and actual pathologic processes present. The physical signs must be considered with special reference to the pathologic conditions that produce each sign. The clinical course observed from day to day affords an opportunity to discuss the consequent change in the pathologic conditions. Coincidental variations in the physical signs must be dealt with at length.

To emphasize the rôle that infection plays, a hypothetic injury should be discussed from which all outside irritants may be excluded. In this way the cellular changes pure and simple, due to the injury alone, may be learned. The introduction of a hypothetic "non-irritating foreign body" into the tissues may be studied. The cellular reactions in such an experiment may be contrasted with those that occur in the presence of an "irritating foreign body" or one that carries various chemical elements into the tissues. This paves the way in the student mind for an understanding of the complicated and varied reactions of the living animal tissues in which infections are present, especially surgical infections. Comparisons may be constantly drawn between the hypothetic simple wound, a wound containing a "non-irritating foreign body," and, finally, an infected wound.

All the possible terminal phases of the surgical-pathologic process should be pointed out in detail, since these suggest what various forms of treatment might avail. It is not the idea that the treatment, as such, is to be taught, though to lose sight of treatment is a bad beginning for the medical student. His great rôle in afterlife, aside from attempting to prevent pathologic processes, is to treat them, and that he cannot treat intelligently unless he understands as much as possible, should be instilled into his mind. This attention to treatment, by necessity not touched on by the instructor in pathology, is one of the many little things that tend logically to connect, in the student's mind, pathologic matters with the clinical features of medicine and surgery.

In addition to the study of injuries and the repair of the various tissues compromised by the so-called surgical infections, a consideration of the special infections, such as the surgical aspects of tuberculosis, syphilis, anthrax, glanders, tetanus and hydrophobia, should also be included, and the surgical terms, cellulitis, abscess, furuncle, carbuncle, toxemia, septicemia, erysipelas, aneurysm, ulcer and gangrene, should be defined and explained. The study of diseases and injuries of anatomic structures, such as vessels, bones and joints, including synovial membranes of tendon sheaths and bursae, and the clinical-pathologic aspect of tumors, must also be covered at length.

Some time must be spent in discussing a normal as contrasted with a pathologic individual who has been subjected to an injury. The rôle that vascular changes and disturbances of metabolism play in the formation of ulcers and in gangrene must be emphasized. The bearing that the common constitutional diseases have on infections and the repair of operative wounds, is also important. For the sake of discussion, [illegible] ation [illegible] election on a simple hernia, restrained [illegible], in [illegible] person under 40 may be chosen. The q[illegible] hei[illegible] or not such an operation shall be done on a person who has chronic nephritis, a heart lesion, diabetes or pulmonary tuberculosis accompanied by cough. Next may be considered an operation on a patient with the same conditions, for a simple inguinal hernia too large to be restrained by a truss; to make the problem complete, a strangulated inguinal hernia, an operation of necessity, should be mentioned. The advisability of operations on pathologic persons should be discussed, regarding not alone the repair of the wound, but also the effect of the anesthetic on organs of absorption and of elimination, the shock of the operation, and the elimination of tissue toxins.

In the second period, when the students meet the instructor in surgical pathology, best in the students' fourth year, very general topics should be taken up. Pathologic material from patients whom the students have seen both clinically and at operation serves well as a basis for discussion. For example, observation of coagulated exudate on the peritoneal coat of an acutely inflamed appendix will lead into the general topic of adhesions, peritonitis, the significance of coagulated and fluid exudates found at the time of operation and their relation to the prognosis. Microscopic sections may also be shown of the same appendix covered with exudate. At the time, sections of adhesions from other conditions indicating different characteristics may be on exhibition.

If there is in the given medical school a course in surgical technic, in which animals are used as subjects, the possibilities in teaching surgical pathology become almost limitless. It is of great advantage for the students to see for themselves the repair of tissue in common abdominal operations, in which healing has been almost ideal. Necropsies in operative abdominal conditions in man are always made under circumstances of peritonitis or some other unfortunate pathologic process. On very rare occasions, the surgeon, because of the necessity for a subsequent laparotomy, chances to see the result of his primary operation. Every surgeon realizes how infrequently these opportunities occur. By necropsy of animals that are making a good recovery as early as thirty hours, and at later intervals, after operation, the students may be shown the suture line of an intestinal anastomosis. Attention may be called to the integrity of the abdominal wall, and practical demonstration may be made of the stress the healing wound will withstand. Pointing out the errors in technic, such as resulting hemorrhage, intestinal leakage with the subsequent peritonitis, and excessive narrowing of intestinal lumen owing to too great invagination of intestinal wall at the time of suture, impresses the students with the importance of guarding against these dangers. This affords the students actual demonstration of the ideal and pathologic conditions that will obtain in similar circumstances in human abdominal cases shortly to be cared for by them as hospital interns.

METHODS OF INSTRUCTION

In teaching surgical pathology, the instructor must decide whether he shall be dogmatic or shall constantly indicate that there are but very few facts and that much is theory or hypothesis. Certain instructors believe that they undermine the confidence of the students both in their teacher and in medicine if they continually point [illegible] that there [illegible] many differences of opinion. Others [illegible] that stu[illegible] [illegible] not capable of judging or deciding [illegible] emselve[illegible] [illegible] ven several hypotheses attempting to [illegible] a clin[illegible] [illegible] non.

These two points of view are obviously short-sighted. As to the first, there is always repetition in teaching, and since several instructors may present to the students their opinions, failing to state them to be but their opinions, the students, when they confer together, as they are bound to do, find that the several statements are at variance. Naturally there is confusion, and their confidence in their several instructors is certainly undermined—just the thing each teacher sought to avoid by being dogmatic.

The second point of view, that the student cannot discriminate, is certainly vicious in itself. In the classroom the student may be blamed for not being able to think; and often as not (as an expedient) he is not allowed to; but, in the first clinical case that the student deals with, the instructor expects him to think and reason both in diagnosis and in treatment. Certainly the embryo physician must often use his wits, and the earlier he commences the better.

A medical student is a postgraduate student, and it is the duty of the instructor to state frankly what is fact and what is theory in discussing any phenomenon. If the instructor so elects, he may state his personal opinion of which is the best theory, assuring himself that the student understands it to be merely an opinion. The discussion of the instructor's opinion tends to widen the student's horizon, to fix the subject in his mind, and to encourage him to think. Many instructors will be disturbed by the free expression of a student's ideas, but it must be realized that in a class of seventy or eighty men many types are present. Their manner in meeting the instructor varies widely, depending on their early environment and education. All these differences must be allowed for by the instructor.

The main thing is that the instructor must realize that he cannot teach unless the student is willing to learn, and the more the instructor leads the student to reason, however skeptical he may be of the student's ability, the better teacher he is.

It must be realized by the instructor in surgical pathology that his subject is far from being a mathematically exact entity. There is but little that the student may learn by rote. And in the student's entire education, even though he be a college man, there are but few subjects that touch on a wider range of sciences than surgical pathology. Because of this, one of the simplest rules of teaching must constantly be borne in mind; that is, to be always informed of the student's conception of each subject from day to day. Simple questioning of the student, the ordinary method of instruction, is not sufficient. Leading the student into discussions and into asking questions concerning the physical signs and pathologic conditions instantly informs the instructor of the progress the individual student is making. Any one may make a seemingly clever answer, but it takes a well-oriented student to ask a sensible question.

Frequently by the very token, as stated, that surgical pathology, its teachings and the fundamental principles dealt with, are far from mathematical entities, it is difficult for the students to realize the wide variations in the physical signs, clinical course, symptoms and pathologic processes and conditions of even type diseases. They may read a given text description of a disease, pneumonia for example, and possess a fair working idea of the morbid process, be able to answer questions with reasonable intelligience, and fail miserably in diagnosis. The given clinical case did not happen to fit the typical text-book description which the students had read. On the other hand, the students do not fall into this pit of a case if presented to them by the clinician. The students realize that this given patient chances to present this or that peculiarity. They also realize that the next case of the same disease may present other peculiarities. When teaching was almost entirely clinical, as in the past, this very fact made the study of type diseases somewhat simpler, although they were less understood. The students read up the theory of the disease subsequent to each clinic and appreciated the similarity of points found in the text and those shown in the clinic. If these clinics are not given in the course of surgical pathology, each student of the class will have a different mental picture of such a condition as an infected wound, for example. The composite of the entire class would likely possess a very good concept of infected wounds, though the ideas on the subject of any one student would not be at all satisfactory.

This may be tested out in a simple manner for the purpose of informing the instructor and for a demonstration to the students to show the students not so much what they do not know as the pitfalls in their path and how they may be avoided. The written descriptions of an infected wound obtained from each student may be compared before the class. The instructor may describe to the students any infected wound that occurs to him and ask them what he has been talking about. An infected wound may be presented in the clinic and the instructor may ask each student in turn, "What is the pathologic condition?" He will be amazed and pained at the dissimilarity of the written descriptions, surprised to learn that but one or two recognized the condition he has described and be shocked to hear but two or three mention the correct pathologic condition. An instructor's first impulse is to complain of the ignorance of the students and to exclaim that they will never learn anything. He must, however, realize the root of the trouble and demonstrate the matter to the students, letting them see for themselves that they must appreciate the wide range of possibilities for injuries and disease and must also bear this in mind when reading from text-books. The students must be brought to see that if an infinite number of pathologic processes and conditions could be observed, every possible variation would be exemplified. For convenience in classification and for description, mile-posts along the clinical and pathologic road have been selected as types and have been given the various familiar clinical and pathologic names. By necessity there are pathologic conditions and processes not occurring at a mile-post, but nearer one than another; from such a mile-post will the process or condition receive its name.

Certain students readily grasp these facts and easily outstrip their companions in the study of surgery; while others, possibly those who have excelled at college in the classics, fall behind and never even reach the plane of apparently much poorer men. This often tends to discourage many who before have had no trouble as students, but cannot properly correlate the knowledge necessary to thoroughly understand the complex biologic facts that exist in living tissues from the time of the incident of an incised wound until its healing is complete.

CONCLUSION

Since surgical pathology shall bridge for the students the wide gap between pathology and surgery, the instructor should be trained as a clinician, and, in addition to being a person with interest in clinical matters, he must at the same time spend many hours in the laboratory, studying both the gross and microscopic aspect of specimens from surgical conditions. Regarding these specimens, strict attention must be paid to the clinical course, the physical signs presented, and the outcome following operations or other treatment. Constant experimentation, involving the fundamental principles of surgery, should also be conducted, in order that, so far as possible, the instructor's knowledge of his subject shall be from his personal observations.

The surgical pathologist is to directly connect the thoughts of the student with the pathologic aspect of surgical conditions; he can therefore best serve his purpose in such a rôle by being an integral part of the department of surgery, making his associations more intimate with the teaching staff of surgery. Thus the surgical pathologist has more direct access to clinical material, and with the laboratories now supported by the department of surgery in many medical schools, facilities to study pathologic material are available. The association of the surgical pathologist with the clinical staff of the department of surgery is also by this means made more intimate; the laboratories of surgery become a clearing-house, as it were, of the clinician for his surgical material. Because of this, the clinical aspect of any concrete clinical condition, by discussions with clinicians, is kept fresh in the mind of the surgical pathologist, and he is not led away by the more or less philosophic and abstract point of view of the pure pathologist.

The field of the surgical pathologist is an exceedingly interesting one because of its concentration, enlivened by the clinical aspect, enriched by facts gleaned from microscopic examination of clinical material obtained at operation and constantly reviewed in the subsequent clinical course. Surgical pathology should introduce to the students fundamental surgical principles and prevent any separation of ideas and concepts of both normal and pathologic processes and conditions as taught in the departments of anatomy, pathology, bacteriology, physiology, physiologic chemistry and of surgery in medical education.

437 West Fifty-Ninth Street.

TEACHING OF OTOLARYNGOLOGY

REPORT OF COMMITTEE APPOINTED TO CONSIDER THE BEST METHODS TO BE FOLLOWED IN THE TEACHING OF OTOLARYNGOLOGY IN UNDERGRADUATE AND POSTGRADUATE SCHOOLS

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The subject assigned to us for our deliberation naturally divides itself into two distinct parts, and yet, in the final analysis, the postgraduate teaching is closely dependent on the thoroughness of the undergraduate work.

TEACHING OF OTOLARYNGOLOGY TO UNDERGRADUATES

In order to ascertain what methods are followed and what views are held in the various leading universities of this continent on this question, your committee submitted a series of questions to the professors of otolaryngology in forty of the leading institutions, the list of these being compiled from the Carnegie Foundation Bulletin 4, entitled "Medical Education in the United States and Canada."

The questions were as follows:

1. Should the "course of instruction" be extended over one or two years?
2. How many hours should be devoted to this "course of instruction?"
3. What proportion should be clinical and what didactic?
4. In what order should these be given?
5. What should be the limits of such a "course of instruction" having in view the necessities of the general practitioner, and the proper balance of the subjects of a medical curriculum?
6. Should "operations" form part of such a "course of instruction?"
7. Should a separate examination in Otolaryngology form an integral part of the final examination?

N. B.—In answering the above questions, which are intended to ascertain the personal views of those responsible for otolaryngology in the leading medical colleges of the United States and Canada, it is desirable to indicate briefly also to what extent these personal views are carried out in the institutions with which the writer is connected.

Replies were obtained from some thirty-one institutions, including over twenty states and provinces so that the opinion elicited may be considered fairly representative. In perusing these reports, your committee was agreeably surprised to find so little divergence in either practice or opinion as the replies revealed, and have therefore the greater confidence in submitting the resolutions which form its conclusions.

We regret that we are unable to elicit satisfactory information as to the amount of "individual instruction" given to each student. Where the number in the classes are considerable (and if possible that number should never exceed six students), as Mygind[1] points out, "the student is apt to acquire superficiality in the examination of the patient. This fault is undoubtedly in many cases due to the teacher not having sufficient time to take each pupil individually and teach him all the details he should observe."

We note also that the idea still lingers in the minds of some of our leading instructors that didactic lectures form an adequate means of instruction. About one-fourth of those reporting asked for equality between didactic and clinical instruction. Surely this cannot be right. The regions involved in otolaryngology are such as lend themselves least readily to demonstration by lectures, or even by lecture-clinics. It is only in so far as the student receives "individual instruction" on the living subject, that he can acquire an adequate knowledge of his subject in the limited time which can be spared in the overcrowded medical curriculum.

This "individual instruction" requires time, patience and competent assistants, but these are well worth the expense involved, as by properly instructing the student of medicine in otolaryngology we will do much to avoid the conditions which now lead to the foisting of vast numbers of what we may style pseudo specialists on the public.

Another point which your committee deems worthy of criticism in dealing with these reports is the scope of the instruction with regard to text-books. Such a course should get as far away from the text-book as possible. We cannot in the least agree with the gentleman who reported, in answer to Question 5, "that the contents of the required text-book on these subjects should be covered *chiefly by recitations.*"

Every student of medicine has a right to be graduated primarily as a general practitioner. The first task of every general practitioner is diagnosis. No amount of text-book recitation will develop the ability to diagnose correctly in otolaryngology, unless there go beforehand the visual knowledge of the normal as contrasted with the abnormal, the education of the eyes, ears and fingers. This education means actual work on the patient and the "course of instruction" should therefore be almost wholly clinical.

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[1] Mygind: Brit. Med. Jour., Aug. 24, 1912.

By Question 5 we hoped to elicit a sufficient answer to a difficult problem. With the daily advance of medical science, new subjects are demanding, with loud voices, admission to an already overburdened course, and even in those universities in which the course is one of five years, it is being found needful to relegate some of the science subjects to the preparatory course, so as to give the student time to digest what he sees daily in the wards. The best of judgment is therefore called for in determining what shall form a part of the minimum curriculum in medicine.

On the other hand, as Gradenigo[2] has pointed out, "what doctors need in their daily practice should be made compulsory, without expecting them to be familiar with complicated examinations and operations." This states in a nutshell what should be included in the "course of instruction" in otolaryngology. The student, therefore, should be made thoroughly familiar with the anatomy, should be taught the use of the instruments of examination, should be able to recognize the normal parts, should be familiar with their appearance in the acute inflammation and in the commoner chronic affections, and finally should be able to recognize and understand the principles of treatment of the acute affections.

With this information in his possession he will have a solid foundation on which to build his superstructure, will be able to read his text-book in connection with a given case intelligently, obtain a comprehensive knowledge of the condition of the various organs of his patient, and, finally, be in a position to secure early and useful assistance from the specialist. Inability to examine a larynx has often led to a failure to recognize malignant disease in its incipient stages, and many examples will occur to all of us in which the lack of training of the student has been to the great suffering of his patient and the disgrace of the practitioner. Such a course will not be complete, however, without instruction from his professor as to what symptoms demand the skill of the specialist, and the unwisdom and criminality of failure to refer the case for examination by the thoroughly trained specialist, when such symptoms arise.

The last question elicited practically unanimous replies that a separate examination conducted by the professor of otolaryngology should form an integral part of the final examination. The association of a question or two on the ear, or throat, on the paper in surgery must be relegated to the past.

Your committee therefore begs to recommend for your adoption the following as the minimum requirements of the undergraduate course in otolaryngology:

RECOMMENDATIONS FOR MINIMUM REQUIREMENTS IN UNDERGRADUATE OTOLARYNGOLOGY

1. Each student of medicine is entitled to receive sufficient instruction in otolaryngology to enable him to deal with the parts concerned as intelligently as with the rest of the human body.

2. For this purpose he should be familiar with the anatomy of the parts, possess a practical working knowledge of the simpler instruments of examination, be able to recognize familiarly the normal appearance of the structures, be practically acquainted with the pictures presented by the acute inflammations, and the commoner diseases of the organs involved, and how to treat the same. He should, further, be instructed to recognize the symptoms of serious complications, the wisdom of early associating the greater knowledge of the specialist in the care of his patient, and the dangers associated with all operations on the parts involved, except in the hands of the competently trained specialist.

3. For this "course of instruction" a share of each of the two final years of the medical curriculum is essential.

4. The said "course of instruction" should embrace both clinical and didactic teaching, preferably intermingled, the clinical to be greatly in excess of the didactic—at least in the proportion of three to one.

5. Clinical instruction should be given to small groups of students, preferably in classes of six, each receiving individual instruction, and this together with the didactic work should extend over a period of at least forty hours in the time of each student in each of the two years.

6. Operations should not form any part of the preceding course, except that in so far as may be possible, each student should be permitted to assist at the performance of the simpler varieties, that he may become practically acquainted with the methods of procedure and the objects sought.

7. A special separate examination in otolaryngology, preferably clinical, conducted by the professor of otolaryngology, should form part of the final examination in medicine of every university, and every licensing body.

8. A copy of these resolutions should be forwarded to the medical faculty of every university and college of medicine, as well as to every state or provincial examining board, in the United States and Canada.

II. TEACHING OF OTOLARYNGOLOGY TO POSTGRADUATES

The second part of this report concerns postgraduate instruction in otolaryngology, and while the former was aimed at the production of the well-rounded general practitioner, this must endeavor to achieve the evolution of the scientific specialist.

The subject is much to the fore on this continent and elsewhere. Last year the *Journal of Laryngology, Rhinology and Otology* published a series of able articles on the education of the specialist in throat, nose and ear disease, in Denmark, Germany, Italy, Austria-Hungary and France. In Great Britain it formed a topic of general discussion at the Liverpool meeting of the British Medical Association. On this continent, it has led to the publication of recent papers by Shambaugh,[3] Ellett,[4] Cragin[5] and others, and formed the basis of an interesting discussion before this society two years ago, a discussion which led to the formation of the committee now reporting. A pronouncement by this important organization will therefore be quite apropos at this serious juncture, for we must not forget that with privilege comes responsibility, and this society, whose membership is so extensive and whose influence is so wide-spread, should—*noblesse oblige*—lead, not follow, in the making of an intelligent public opinion.

According to Mygind[1] the postgraduate education of the specialist on the continent may be divided into three stages: (1) a compulsory preliminary training at the university for a period of one term; (2) a postgraduate course at a university or hospital; (3) a service as assistant at a special public clinic.

We all know the facts, and we deplore them: now what can be done to face and overcome the difficulties of the situation? We must first decide what constitutes the standard of proper training, then provide for its acquirement, and finally bring such influence to bear on state legislatures as to secure the legal enactment that only specialists provided with this training may practice as such.

Those who have written on this subject are agreed that not less than two years should be devoted to preparation for practice as a specialist. This should be preceded, however, by one or more years spent in general practice, or better as house-man in the medical and surgical services of a good hospital, at least half the time being devoted to surgery. The specialist course itself must embrace highly specialized studies in the anatomy, physiology, embrylogy, pathology, physics and therapeutics which bear on the subject, operations on the cadaver, etc.

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[2] Tr. Am. Laryngol., Rhinol. and Otol. Soc., 1911.

[3] Shambaugh, G. E.: The Specialist in Medicine, THE JOURNAL A. M. A., Sept. 21, 1912, p. 1088.

[4] Ellett: South. Med. Jour., January, 1911.

[5] Med. Rec. New York, lxxx,

The time required for this course will occupy at least six months. In addition the candidate must subsequently serve as a resident assistant in a special hospital or in a similar position in the special service of a large general hospital, for a period of not less than eighteen months, and to provide sufficiency of experience, the special clinic should work daily, and should have at least fifteen beds assigned to its use. In this connection it is well to insist that during the last six months of his service, the candidate shall act as a senior assistant in the major operations, and personally perform those less important.

Where shall such training be provided? Without doubt the scientific part must be placed solely under the control of the universities, for these are the proper bodies to provide postgraduate instruction.

To add a fitting coping-stone to the structure whose erection we are considering, the candidate should finally be compelled to present himself to one of the universities, supplying the postgraduate instruction indicated above, for examination on the work embraced in the entire course, and the successful candidate should be given a degree; that of Ph D., (Oto-Laryngology) has been suggested in various quarters.

The final step, that of securing legislative measures, would of necessity be difficult to attain, but public opinion will ere long demand that we be protected from the incompetent specialist, as we are now from the ill-trained dentist.

With regard to postgraduate teaching in otolaryngology your committee begs to recommend:

1. That the time has arrived to standardize the degree of scientific attainment, and of clinical training, which shall qualify those who wish to begin the practice of otolaryngology as a specialty.

2. That the report of this committee now submitted forms a suitable basis for such a standardization.

3. That a committee representing this society be appointed to work out the details.

4. That the other important associations of otolaryngologists on this continent, namely, American Laryngological Society, the American Otological Society, the American Medical Association, the Academy of Ophthalmology and Otolaryngology, be and are hereby invited to appoint representatives to act with the above committee from this society, so that the action finally taken shall represent to the fullest extent the consensus of opinion of American and Canadian otolaryngology.

CARE OF THE UMBILICAL STUMP

A BACTERIOLOGIC STUDY [*]

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It is not my intention to consider the clinical aspects of infections which affect the new-born infant through the umbilicus. The seriousness of such infections is well recognized. The more severe and fatal forms present clinical and post-mortem evidence which forces itself on the observer. The proof that milder types of infection originating in the umbilicus cause fever, jaundice, loss of weight and gastro-intestinal disturbances in the new-born infant is difficult to bring forward. It has been demonstrated that serious and fatal umbilical infections can exist and give no local antemortem evidence of their presence. It would not be unfair to conclude that milder forms could exist and the infant recover without local manifestations of umbilical disease. Such infections occur in isolated cases and in epidemic form in institutions. There may be the moist gangrene with the foul-smelling, putrefying cord, a simple omphalitis with a discharge of varying character, an ulcer lying between the folds of the skin at the navel, a more or less diffuse cellulitis, possibly with abscess formation. The arteries and veins may be involved with little or no local evidence of this condition. Infection of the arteries is more frequent and less serious than that of the vein which is almost invariably fatal. The septic form of umbilical hemorrhage may result from infection entering through this wound. Some of the more specific infections, such as diphtheria, tetanus and erysipelas may originate at this point. The much dreaded sepsis may enter and destroy the new-born babe and leave very little evidence of its entrance at this point.

In children born spontaneously, the cutting of the cord makes the only wound on its body, and this should be considered as important a wound as one which enters the peritoneal cavity. Other sources of infection must be admitted, but many of them are in no way under our control.

The care of the umbilical stump is something for which obstetricians and nurses are directly responsible. Are they fully aware of their responsibility? Certainly many of us would not care to have our peritoneal cavities opened under the same precautions which we take in severing and caring for the umbilical cord. This is especially true when we consider the great susceptibility of the new-born child to infection. Anatomically, the cord leads almost directly into the peritoneal cavity. The arteries are almost intraperitoneal and the postnatal thrombus forms an ideal place for the development of organisms. The vein, in addition to being closely associated with the peritoneum, leads directly to the liver and communicates with the large venous circulation. The lymphatics are in almost direct communication with the peritoneum. Wharton's jelly becomes virtually subserous by its extension within the abdominal wall.

The absorptive powers are great, as has been demonstrated by Epstein[1]—who used different chemicals on the cord and was able to demonstrate them in the urine within a very short time.

Clinically, there is abundant proof that fatal infections may enter through the umbilicus and rapidly overwhelm the new-born babe. Eröss[2] reported 1,000 cases, with fever in 43 per cent. and evidence of navel infection in 23 per cent. Roesing[3] in 100 cases found fever in 21 per cent. and umbilical infection in 9 per cent. Götzl in 130 cases found trouble with the navel in 13 per cent. Berend and Racz.[4] in 1,000 babies who were tubbed, found infection in 19.7 per cent., in 1,000 not bathed in only 9.3 per cent. Doctor[5] investigated a series of cases in which 420 infants were bathed, 33.15 per cent. of these had a febrile reaction and 16 per cent. showed infection of the navel. Of 462 babies with a long stump of cord, which were not bathed, there was fever in 25.83 per cent. and umbilical infection in 10.12 per cent. There was fever in 11.88 per cent. and navel infection in 3.46 per cent. of 230 infants with a short stump which were not bathed.

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[*] Read in the Section on [illegible] and Abdominal Surgery of the American [illegible] the Sixty-Fourth Annual Session, held at [illegible]

[1] Epstein: Ueber antiseptische Maasnahmen in der Hygiene des neugeborenen Kindes, Medizinische Wandervorträge, Berlin, 1888.

[2] Eröss: Beobachtungen an 1,000 Neugeborenen über Nabelkrankheiten und die von ihnen ausgehende Infection des Organismus, Arch. f. Gynäk., 1891, xli, 409.

[3] Roesing: Beobachtungen an 100 Neugeborenen über Temperaturverhältnisse und Nabelerkrankung, Ztschr. f. Geburtsh. u. Gynäk., 1894, xxx, 176.

[4] Berend and Racz: Beiträge zur Frage der Nabelpflege und des Badens der Neugeborenen; Ref., Zentralbl. f. Gynäk., 1904, No. 39, p. 1173.

[5] Doctor: Ueber die Heilung und Behandlung des Nabels, Arch. f. Gynäk., 1894, xlv, 539.

In 1896, Lambert[6] reported a series of 147 cases in which there were five deaths from infections originating at the umbilicus. This is a mortality of about 3.4 per cent. He was pleading for a better treatment of the umbilical cord. We all see such cases not very infrequently.

Dickinson,[7] in a most excellent and thorough consideration of this subject, collected from the literature more or less complete observations of over 10,000 new-born children. He says: "Fever due to navel infection, from 3.5 to 22 per cent., studied on 2,755 babies (the higher percentages in summer); well-defined general sepsis, 5.25 per cent., the review embracing 1,329 babies; deaths from sepsis, a full 1 per cent., the material being 6,011 new-born children. The ratio of septic deaths to early deaths from all causes varies between 15 and 40 per cent."

More recently, 795 cases treated in the Virchow-Krankenhaus by ligation and a sterile dressing smeared with oil showed inflammatory disease of the navel in 15, or 1.7 per cent.

In an endeavor to find some means of preventing these infections, I have been led to make some investigations which it is my intention to present at this time.

The first step has been to find out whether or not organisms are present on the cord and surrounding skin immediately after birth. It would be only natural to find them present.

Cholmogoroff[8] removed, with sterile scissors, pieces of the umbilical cord immediately after birth in five cases. Cultures made from these were all negative. He also investigated cases which were treated by different methods and found various staphylococci, once the streptococcus and various non-pathogenic organisms. He concluded that the cord was sterile at birth and that the germs were introduced from without.

It would be very easy for the surface of the umbilical cord and of the child's abdomen to be contaminated with any organisms present in the mother's vaginal tract or on the external genitalia. If they were on the surface, it would be very easy for them to grow and invade the tissues.

In order to prove the presence or absence of organisms on and around the cord immediately after birth, the following procedure was employed:

A platinum loop was used to scrape the cord and surrounding skin immediately after birth and before the cord was handled or manipulated in any way. Agar plate cultures were made from the material caught on the platinum loop. All these cultures were made under as nearly the same conditions as possible in the Elliot Memorial Hospital at the University of Minnesota. No attempt was made to isolate the anerobic organisms.

There were sixty-five cases examined in all. In seventeen of these there was no growth. Non-pathogenic organisms were found independently of any pathogens in thirty-three cases, or over 50 per cent. of those examined. Pathogenic organisms were found alone or associated with non-pathogens in twelve, or 19.46 per cent. Some variety of staphylococcus was found in eight instances and some form of the *B. coli* group in four cases.

The significance of this is evident. The cord and its surroundings show the presence of pathogenic organisms in nearly one-fifth of the cases immediately after birth. This is true where the cases are conducted amid the aseptic surroundings of a delivery room. The percentages might easily be much higher where less rigorous asepsis is carried out. This, of course, is no argument for carelessness in the subsequent handling of the cord, for it may be infected at any time.

What are the essentials for the growth of organisms? (1) the presence of the germs, (2) proper degree of temperature, (3) a suitable culture medium and environs, and (4) the presence of moisture.

It is evident that it will be very difficult to eliminate entirely the presence of bacteria, but we can avoid contaminating the parts with germs and we can assist in their removal by the use of aseptic and antiseptic measures. The body heat furnishes the proper temperature and, of course, cannot be interfered with.

The devitalized tissue of the cord forms a fine medium for the growth and development of the organisms. This can be removed by ligating or clamping the cord close to the skin margin. It has been pretty well demonstrated that better results are obtained by leaving as little cord as possible. Doubtless the methods of amputation proposed by Dickinson, which in his hands have given almost ideal results, accomplish this most thoroughly.

The presence of moisture may be controlled by having a small stump of cord and keeping it under conditions which favor rapid drying. Various experiments have been conducted along this line and it has been found that exposure to air is one of the best means of accomplishing this end. Hygroscopic powders have been used with some success—good results have been obtained by the use of astringent and inert powders. Equally good, or better results have been obtained without any dusting powder. Oily dressings have not given as good results. Dry occlusive dressings have been used. Gauze seems to permit of better and more rapid mummification than cotton.

In order to fulfil these conditions, the new-born babies have been treated as follows at the University of Minnesota Hospital:

After cessation of pulsation, the cords were clamped near the skin margin, the surrounding skin and cord cleansed with alcohol, and the clamp removed, to be replaced by a ligature in the groove made by the clamp. The end of the cord and the surrounding skin were painted with one-half strength tincture of iodin in some cases and in others left untreated. A sterile gauze dressing was then tied over the end of the cord. The babies were oiled for three days, then washed, but no tub baths were given until the navel was healed. Each day the stump and surrounding skin was washed with alcohol and the dressing changed when necessary.

A study of the clinical courses of these cases subsequent to delivery may be of interest and profit.

First in order is a consideration of those cases from which cultures were taken. In all there were sixty-five cases, one of these was a still-birth, there were three unsatisfactory cultures, which leaves sixty-one for study.

There were seventeen cases which showed no growth; of these four, or 23.5 per cent., showed a febrile reaction of over 100 F; there was one case with jaundice and the average maximum weight loss was 209 gm.

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[6] Lambert: Umbilical Sepsis in the New-Born Occurring at the Nursery and Child's Hospital, New York, during 1896, Med. News, New York, 1897, lxx, 557. Petermöller: Neue Beiträge zur Behandlung des Nabelschnurrestes der Neugeborenen, Monatschr. f. Geburtsh. u. Gynäk., 1911, xxxiv, 207.

[7] Dickinson: Is a Sloughing Process at the Child's Navel Consistent with Asepsis in Childbed? Am. Jour. Obst., 1899. xl, 389.

[8] Cholmogoroff: Die Mikroorganismen des Nabelschnurrestes Ref., Jahrb. f. Kinderh., 1890, xxxi, 145.

Of the thirty-two cases from which non-pathogenic organisms were recovered, there were eight, or 25 per cent., with febrile reaction; three infants were jaundiced and the average maximum loss of weight was 188 gm.

There was a temperature rise in three, or 25 per cent., of the twelve cases in which pathogenic organisms were found; one was jaundiced and the average maximum weight loss was 202 gm.

The figures are so close for the different groups that the only conclusion one could draw would be that so far as this series is concerned it made little difference whether or not the organisms were present at birth.

There was no definite evidence of any serious infection of the navel. Two were somewhat reddened without any febrile reaction, jaundice or marked loss of weight. There were two with some foul odor, one had a febrile reaction of 102 F. and a weight loss of 340 gm. The other had no reaction. Neither had any jaundice. A number of others did not heal so rapidly as usual but showed no signs of infection. None of these babies died and all left the hospital in good condition.

Fifty-eight infants were treated as outlined above with alcohol and dry dressing. Of these, fourteen, or 24.13 per cent., had a rise in temperature to 100 F. or over; eight, or 13.08 per cent., were jaundiced, and of these four had fever and there was an average maximum loss of weight of 246.2 gm. The average loss of weight in the febrile cases was 314 gm. Five, or 8.6 per cent., had slight local evidence of navel infection, but none of them had a temperature rise to 100 F. The cord came off in five and one-half days on an average.

In the second series of cases, tincture of iodin was used to paint the cord and surrounding skin. Otherwise the treatment was the same as in the preceding series.

There were 186 babies treated in this way. The temperature rose to 100 F. or above in forty-two, or 22.58 per cent. of these; fifteen, or 8 per cent., were jaundiced, of which five had a febrile reaction. The average loss of weight was 228.05 gm. In the cases with fever, this loss amounted to 285.19 gm. Ten, or 5.37 per cent., had slight local evidence of infection of the navel, only three of which had any fever. The cord came off in seven and one-half days on an average. None of the babies in either series had any evidence of serious or fatal infection originating in the navel. How many of these febrile cases were caused by absorption of some toxic substance or the entrance of organisms through the umbilicus it is not possible to state. Many conclusions cannot be drawn from this rather small amount of material.

It is evident that some facts can be stated.

1. The cord is contaminated with pathogenic or non-pathogenic organisms at or immediately after birth in a large percentage of cases.

2. It is possible quite effectively to combat serious umbilical infections by comparatively simple methods; as shown by this report of over 200 cases with no mortality from this cause.

3. There seems to be little choice between the two methods used in these cases.

4. Jaundice in the new-born child is frequently associated with fever. It would not be illogical to suspect that this might originate by some agent introduced through the umbilical vein or lymphatics.

5. Febrile reactions are common in the new-born infant and are associated with other disturbances, such as a high primary weight loss and jaundice. They are due, no doubt, to many causes, but we, as obstetricians, should see that those due to infections entering at the umbilicus are reduced to an irreducible minimum.

For assistance in this work I am greatly indebted to the interns and nurses at the University Hospital, and especially to Prof. W. P. Larson for guidance in identifying the various organisms which were found.

ABSTRACT OF DISCUSSION

Dr. Charles S. Bacon, Chicago: I have made a practice for years of ligating the cord immediately after birth just at the juncture of the skin and cord, leaving a button simply large enough to prevent the sliding of the cord, and then dressing this with sterile cotton after first washing with alcohol. Every day I wash with alcohol and reapply sterile cotton. I have not forbidden the bath of the baby, believing that the amount of contamination in the bath-water is slight and is counteracted entirely by the immediate use of alcohol, which is the only safe antiseptic to use on the baby. With this method of treatment I have seen no serious infections and very rarely any infection at all. That there is a good deal of danger from the cord I have no doubt. I have myself seen a case of tetanus in midwife practice in which the bacillus was found around the navel. I believe that these observations can be extended to a variety of conditions, which will settle for us whether or not the bath is really accompanied with danger provided a safe antiseptic like alcohol is used immediately.

Dr. N. Sproat Heaney, Chicago: I consider the clamp that Dr. Adair mentions a good thing since it squeezes out the moisture and allows the cord to dry out early. The earlier that the cord drops off and the wound heals the better, so the best treatment of the cord is that which best promotes this and at the same time best protects it from infection. I believe that cutting the cord long is better than cutting it short. When the cord is cut short the invagination of the umbilicus draws the stump in, and it becomes so closely approximated to the child's abdomen that it stays moist unduly long and does not drop off early. If cut longer and at the time squeezed dry, the long dry cord, wrapped in the sterile gauze abdominal band, allows the air to dry out along the whole extent of the cord and the cord consequently drops off earlier. This was our experience in Vienna with the short and long cutting of the cord. Cotton is especially objectionable since it is too impervious to the air. I should not want a laparotomy wound manipulated daily, and for the same reason I should not want the child's cord to be manipulated daily. I should want it made as nearly sterile as possible at the time of birth and left untouched as much as possible thereafter, having dressings changed only when wet or soiled.

Dr. F. L. Adair, Minneapolis: In no branch of surgical work is asepsis more essential than in obstetrics, and I think further that we forget, many times, that we should carry our asepsis beyond the delivery of the mother and apply it to the baby also. In answer to Dr. Heaney, who said that the long cord drops off earlier than the short, I wish to say that this may not be desirable if we have a healthy wound covered with a scab. There is no better protection for the granulation tissue under the dry cord than a dry scab which covers it. Therefore, the statement that the long cord drops off early may not indicate a desirable condition.

Birth-and-Death Bookkeeping.—We need, first of all, to do what Sweden has done for 150 years, namely, to keep proper vital statistics. Vital statistics are the bookkeeping of health, and we cannot economize health any more successfully than we can economize money unless we keep books.—Irving Fisher, Ph.D., Professor of Political Economy, Yale University.

OPERATIVE TREATMENT OF CANCER OF THE STOMACH *

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The surgical treatment of cancer of the stomach compares favorably in results with the treatment of cancer of any other organ in the human body. When it is taken into consideration that nearly one-third of all cancers occur in the stomach and that their early discovery is a necessary factor in the cure of the disease, the necessity for a clear conception of the value of the various signs and symptoms is at once manifest.

With the hope of obtaining some definite information on these important points, an investigation was made in our clinic of the histories of a thousand patients submitted to operation for cancer of the stomach. These operations were performed between Jan. 1, 1894, and Dec. 31, 1912. For purposes of study they have been classified as follows: resections, 378; palliative operations, 246; explorations, 376.

The diagnosis of cancer of the stomach cannot often be made early enough to obtain a radical cure by operation, but a diagnosis of some condition of a surgical nature, probably cancer, can be made in time to permit operative interference in more than one-third of all cases (378 out of 1,000). The early diagnosis does not depend on any sign or symptom due to the cancer itself, but on the mechanical conditions produced by the growth. Therefore, in cases of suspected cancer of the stomach the recognition of such mechanical conditions should be the first aim of the diagnostician.

A probable diagnosis can be established by simple methods. In 67 per cent. of the total number of cases in this series tumors, some of which were of considerable size, could be palpated. The idea prevalent in the past that finding a tumor indicated an inoperable condition has been proved a mistaken assumption. A movable tumor is a favorable condition, especially if accompanied by early obstruction. We have a number of cases on record of patients who were operated on after a tumor was discovered, who are alive and well after a number of years.

Food remnants in definite amounts were found in 53.3 per cent. of the series, and gross obstruction was present in 20 per cent. Since more than 50 per cent. of all patients with cancer of the stomach have food remnants, it will readily be seen that, next to tumors, food remnants are the most important sign, not necessarily of cancer of the stomach, but of mechanical obstruction. A combination of tumor and obstruction is nearly pathognomonic of cancer in every case otherwise suspicious, and these two easily obtainable signs are of the first importance. Tumors, if present, are usually palpable and obstructive. At least 75 per cent. of cancers of the stomach have their origin in the pyloric end, a situation in which diagnostic conditions develop early. In this connection loss of weight is an important sign; the average loss in this series was 30 pounds.

Cancers of the body and fundus of the stomach occur in about 25 per cent. of all cases. When located at the cardia these growths produce early obstruction, but are not as yet surgically removable. In the body of the stomach but few can be diagnosticated sufficiently early to permit operation, because they are situated behind the margins of the ribs where a tumor cannot be palpated until a late stage, and, because of the wide gastric lumen, obstruction is a late development. In the few cases we have been able to diagnosticate early enough to warrant operation the patients were thin and gastroptosis was present, which made a tumor palpable.

The evidence furnished by the Roentgen ray is next in importance to the discovery of tumor and food remnants. It is a valuable aid in the diagnosis, not because it demonstrates in the early stage that cancer is present, but because it shows deformities and muscular deficiencies that are evidences of cancer. It is also of great importance as a means of elminating from the operative group those advanced tumors of the body and fundus of the stomach which lie concealed under the ribs, and which have already progressed beyond the reach of surgical aid. The Roentgen ray also gives valuable confirmation as regards the presence of obstruction and tumor in cases of cancer of the pyloric end of the stomach.

The examination of the contents of the stomach during the curable period of the disease is of relative value, but is not pathognomonic.

For purposes of comparison, an investigation has been made in our clinic of a thousand cases of ulcer of the stomach and duodenum in which operation has been performed within the last six years (from Jan. 1, 1907, to Dec. 31, 1912). There was an average total acidity in these cases of above 63, more than five-sixths of which was free. In the thousand cases of cancer of the stomach, there was an average total acidity of 31, about one-third of which was free. These data bear out the accepted hypothesis that low acidity and especially low free hydrochloric acid content is indicative of cancer of the stomach. Low acidity, however, may be found in a large variety of conditions, but one fact was noted particularly, that is, a cancerous stomach always contained some acid although the free hydrochloric was often absent. The more advanced the case the lower the acidity and the less the free acid content. Lactic acid was found in 43 per cent.

Blood in some form was found in 73 per cent. of the cases. Severe hemorrhage from the mouth occurred in 4 per cent., coffee-ground vomit in 6.25 per cent., and hemorrhage from the bowel in 9 per cent. Occult blood in the stool was the rule. Occult blood is present, however, in so many conditions other than cancer of the stomach that its value as a positive sign is not great. Smithies[1] states that the Oppler-Boas bacillus was demonstrated in 93.8 per cent. of the last 146 cases of gastric cancer observed in our clinic. These figures were obtained by oil immersion of smears stained by the colored agar method.[2]

The gastroscope has not yet been perfected for practical use, although a great deal of experimental work has been done with the instrument (Jackson,[3] Plummer,[4] Janeway[5] and others) which promises well for the future.

A history of gastric disturbance precedes cancer in a large number, if not the majority, of cases. The average duration of symptoms in the series of one thou-

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* Read in the Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

[1] Smithies, Frank: The Significance of Gastric Ulcer with Respect to Gastric Cancer. A Study of 566 Consecutive Operatively and Pathologically Demonstrated Cases of Cancer of the Stomach, THE JOURNAL A. M. A. (to be published).

[2] Smithies, Frank: A Method for the Microscopic Examination of Gastric Extracts and of Feces, Arch. Int. Med., June, 1912, p. 736.

[3] Jackson: Tracheobronchoscopy, Oesophagoscopy and Gastroscopy, 1911.

[4] Plummer: Quoted by Jackson, see footnote 3.

[5] Janeway: The Relation of Gastrostomy to Inoperable Carcinoma of the Esophagus, with a Description of a New Method of Performing Gastrostomy, THE JOURNAL A. M. A., July 12, 1913, p. 93.

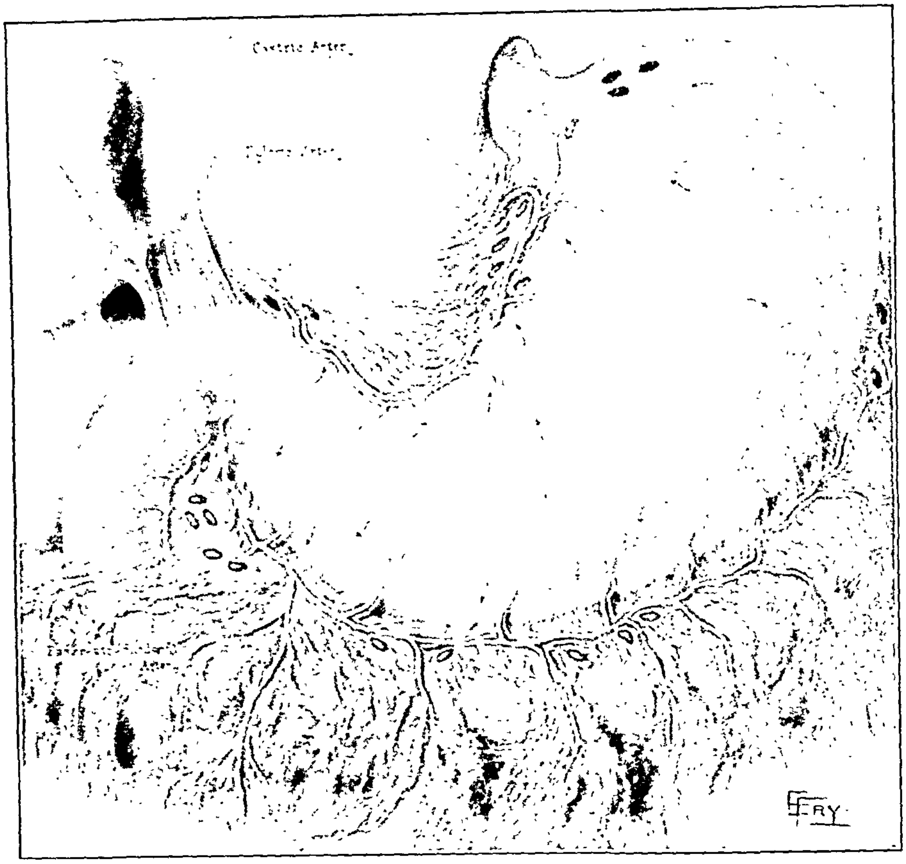

Fig. 1.—Distribution of the lymph-vessels of the stomach.

sand cases was more than two years. This would indicate that in at least the majority of cases of cancer of the stomach, some lesion, ulcerous or otherwise, existed previous to the development of cancer —a point which has been disputed so far as cancer of the stomach is concerned, although accepted for all cancers on the surface of the body, where, so far as we know, cancer has never developed without a previous lesion. In an investigation by Wilson and MacCarty[6] of 218 cancers of the stomach removed by operation in our clinic, it was found that ulcer or some primary lesion of a similar character had existed in more than 50 per cent.

The art of the diagnostician lies in weighing the evidence at hand, and it is the rule that a correct diagnosis, if made at all, will be made on comparatively few signs and symptoms of definite value. The presence of tumor and obstruction, supplemented by roentgenoscopy and the examination of the contents of the stomach indicates the lines of investigation. The exploratory incision is the final test and on the diagnostician devolves the difficult task of determining which of the patients shall submit to such procedures. To give the patient a fair chance exploration must be done early.

Under present conditions the patient who is submitted to exploration with a probable diagnosis of cancer of the stomach has a little over one chance in three of a radical operation, a little less than one chance in three of a palliative operation and about one chance in three that the operation will be merely an exploration.

Every operation for cancer of the stomach should begin as an exploration. Exploratory operations for cancer of the stomach are not devoid of danger to the patient. In the 376 explorations in our series of one thousand in which nothing further was done, there were six (1.6 per cent.) deaths. In none of these cases, however, could the exploration be considered the direct cause of death. In most of the fatalities the disease was far advanced, a fact that we had failed to estimate correctly.

In cases of suspected cancer of the stomach it is the practice in our clinic to make a small incision

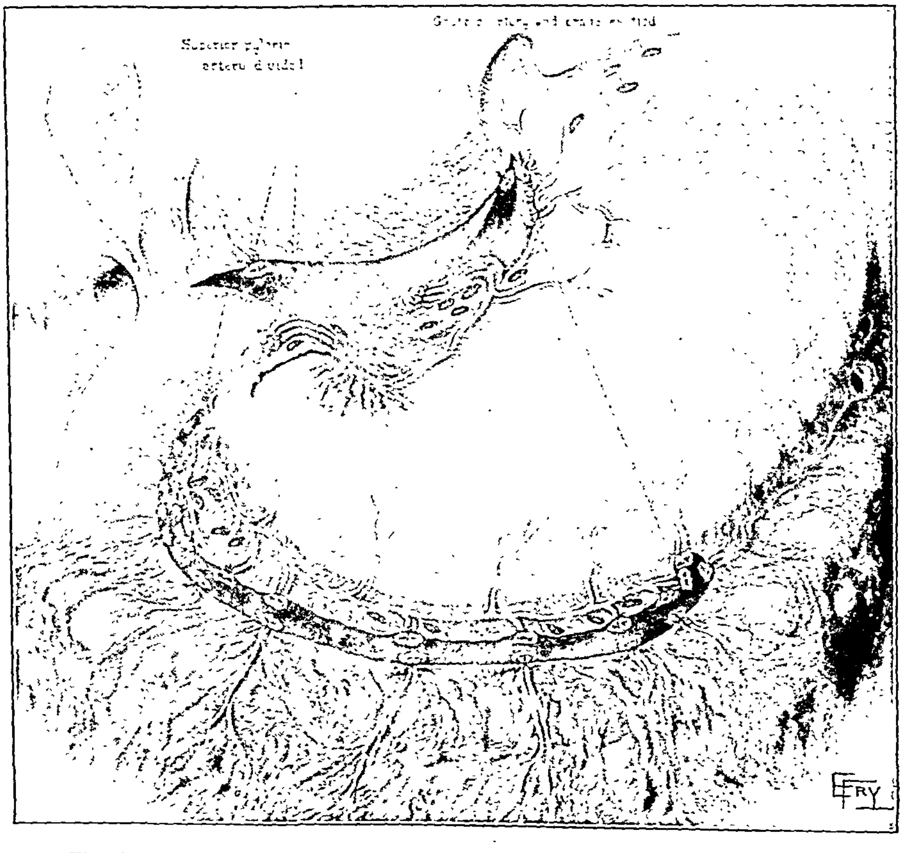

Fig. 2.—Carcinoma of the lesser curvature of the pyloric end of the stomach, with separation of the lymphatic groups. Dotted lines show proposed resection.

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[6] Wilson and MacCarty: Am. Jour. Med. Sc., December, 1909.

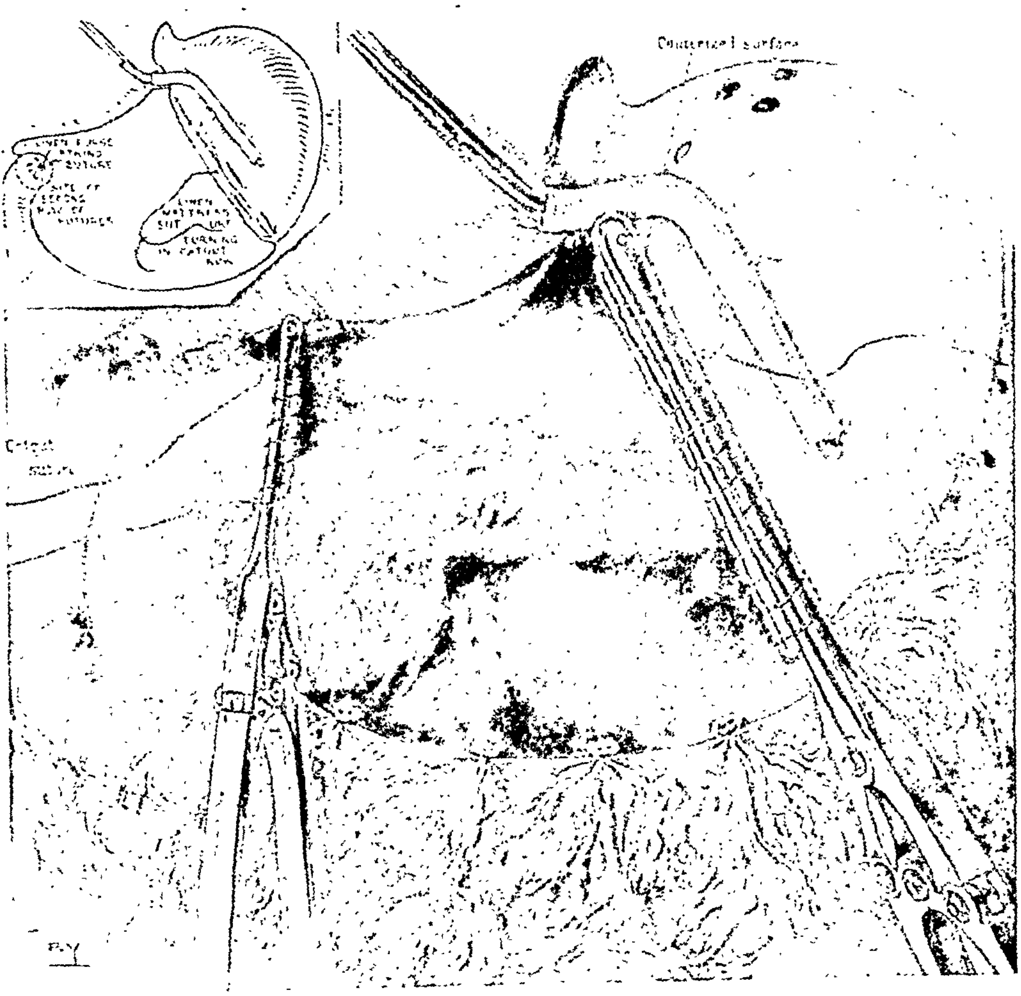

Fig. 3.—Method of closure of the ends of stomach and duodenum by continuous chromic catgut suture, to be followed by musculoperitoneal suture or linen (see small diagram).

in the epigastric midline, opening the peritoneum to the left of the suspensory ligament of the liver. The stomach and accessible portions of the liver are examined with two fingers. In a certain percentage of cases the hopeless nature of the condition will immediately be seen and the wound can be closed at once with buried sutures of linen or silk. This enables the patient soon to return to his family and friends. An exploration of this nature can be conducted under local anesthesia with novocain and the patient disturbed but little. In a large number of cases, however, such explorations are inadequate and the incision must be enlarged sufficiently to introduce the hand in order to make a more careful survey of the stomach, omenta, liver and peritoneal cavity. In such explorations the traction on the wound will ordinarily cause enough pain to make the use of ether advisable.

If, on exploration, a resection is deemed possible, the portion of the stomach containing the tumor is withdrawn from the abdominal cavity for further inspection. This examination will include the transverse colon and mesocolon. Occasionally the transverse mesocolon is involved in the arcade between the main branches of the middle colic vessels, and the portion involved can be removed without endangering the vascular integrity of the transverse colon. In a few instances in cases otherwise favorable for operation, the transverse colon was also involved and we then resected the diseased portion of the stomach with the involved transverse colon attached. One question rather difficult to decide is, what action to take when the disease in the stomach is mechanically removable, but infected lymph-nodes exist which are not removable. If such patients are in fair condition and the operation can be done without too great risk, we perform a resection. The resulting one or two years of comfortable existence for the patient seems to justify the action.

Moderate involvement of the pancreas does not necessarily preclude operation. Involvement of the pancreas has been considered a bar to resection of the stomach, but we have satisfactorily removed superficial portions of the pancreas in over 8 per cent. of our resections,

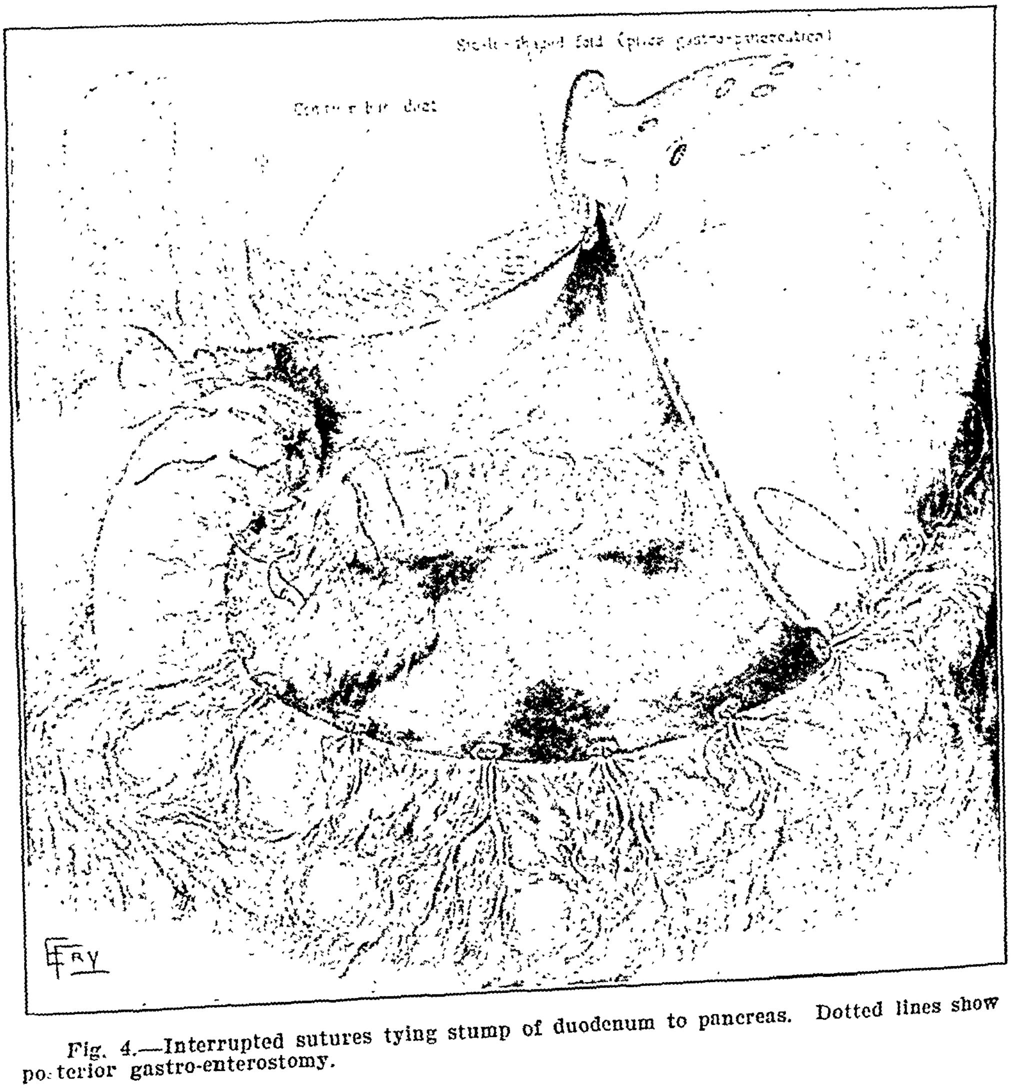

Fig. 4.—Interrupted sutures tying stump of duodenum to pancreas. Dotted lines show posterior gastro-enterostomy.

closing the end of the duodenum with purse-string sutures and implanting it into the excavation in the pancreas (Meyer[7]). Leakage has not occurred from either the pancreas or the duodenum, and altogether the technic has been most satisfactory. In our earlier work we were much concerned over the possible outcome of these procedures, since Haberkant[8] and Mikulicz[9] had shown a mortality of 70 per cent. or more in like cases. In reviewing our cases, however, we have not found that the mortality was increased more than 1 per cent. as a result of these complications.

Enlarged lymph-nodes will be found in a high percentage of cases of cancer of the stomach, but are not always malignant. The relative degree of involvement may be noted as follows:[10] (1) the group along the lesser curvature; (2) the inferior pyloric group; (3) the group along the greater curvature, and (4) the superior pyloric group. Early ligation of the four blood-vessels acts as a starting point for the separation of the lymph-nodes.

With some exceptions the restoration of the gastro-intestinal tract can be best affected by the Billroth No. 2 method, that is, complete closure of the ends of the duodenum and stomach with an independent gastrojejunostomy, preferably by the posterior route. If the remaining pouch of the stomach be small, however, anterior gastro-enterostomy appears to answer the purpose equally well and is easier of performance.

In some cases of extreme malnutrition it may be advisable to do a gastrojejunostomy to be followed by a resection in two or three weeks, when the patient is in better condition. We have practiced this method occasionally, but, if the case is otherwise favorable, we prefer to make an immediate resection because it disposes of a foul, sloughing mass in the stomach, and the risk in doing the complete primary operation is little, if any, greater than in doing the operation in two stages. Palliative operations on the stomach are of some value but they should not be performed except for the relief of mechanical conditions, such as obstruction or, occasionally, when a differential diagnosis between ulcer and cancer cannot be established. In an occasional case perforation of an ulcer with adequate peritoneal protection occurs, but whether it is benign or malignant cannot be determined. If malignant, it cannot be removed, and the operation will be palliative; if benign, a cure results.

Gastrostomy is often a valuable operation in cancer obstructing the cardiac end of the stomach. It should be made with a No. 16 English catheter and preferably by the Witzel method. We performed this operation in a number of instances with a small catheter, about No. 8 or No. 9 English, fearing leakage, but we have gradually acquired confidence in the use of the larger size, which permits greater range of dietary. Pierce Gould[11] has called especial attention to the value of a No. 18 English catheter is gastrostomy.

In pyloric obstruction an anterior gastrojejunostomy after the method of Wölfler[12] and Hartmann[13] is the operation of choice since it can be accomplished with less manipulation than is necessary to reach the posterior wall of the stomach in order to perform the posterior operation. In our experience a vicious circle has not followed this plan, and the average mortality has been a little more than 4 per cent. We have had a somewhat higher mortality following the posterior gastrojejunostomy for malignant disease, evidently due to the increased manipulation.

Jejunostomy is occasionally a valuable method in cases of cancer of the stomach, especially in those high posterior perforations in which a radical operation is not possible. The involvement may be so high on the stomach that a gastrojejunostomy cannot be done on the proximal side, and in some cases it cannot even be determined whether or not the ulcer is benign or malignant. The jejunostomy is usually made from about 12 to 16 inches down from the origin of the jejunum by the Witzel method and using a No. 12 English catheter. We have had no leakage in these cases, nor has the attachment of the jejunum to the abdominal wall been a cause of later trouble. Jejunostomy, in cases of either ulcer or cancer, affords adequate feeding and gives complete rest to the involved stomach. If the condition be ulcer, the improvement in nutrition is almost as valuable as rest in stimulating the healing process. A rapid gain in weight and strength is the rule in these cases. The operation is also of great value in cases of accidental injury during the exploration of a cancerous stomach in which resection cannot be done.

CONCLUSION

It may be said that with our present means of diagnosis, cancer of the pyloric end of the stomach can be recognized sufficiently early to perform the radical operation in at least half the cases. The mortality is about 10 per cent., depending largely on the class of cases accepted for operation. If an early diagnosis has been made and the patient is in good condition, the mortality will be less than 5 per cent. There is a prospect of a five-year cure in about 25 per cent., and of a three-year cure in 38 per cent., in the case of those who recover from the operation. Comparatively few patients who recover following resection fail to get more than one year of relief.

ABSTRACT OF DISCUSSION

Dr. William L. Rodman, Philadelphia: There are forty thousand deaths from cancer in the United States every year, and, if we accept the statement of that conservative pathologist, Virchow, even a larger percentage than Dr. Mayo gave to-day, 35 per cent., die from cancer of the stomach.

There are several points which, I think, ought to be made clear in connection with cancer of the stomach. It is frequently impossible to make a positive diagnosis at such time as to warrant a radical operation from symptoms alone, but nearly always there will be enough symptoms to warrant an exploratory operation. My judgment is that in a disease which is so common and so fatal, and which so quickly passes the operable stage, more frequent exploratory laparotomies are necessary and should be demanded. The symptoms of cancer are vague, indefinite and widely variant, depending much on its location. At the cardia they may be pronounced early; at the pylorus, the more usual site, they are usually late and due to obstruction. The surgeon should, moreover, be held accountable for the proper surgical procedure. Palliative operations are of questionable utility. Encouraging as it is to have Dr. Mayo tell us that in 38 per cent. of his operations there has been a three-years' cure and in 25 per cent. a five-years' cure, could we not do a great deal better if we operated during the precancerous stage or when the lesion is still benign, or simple ulcer? Not only do we find cancer engrafted on ulcer in more than 50 per cent. of the cases at the Rochester clinic, but Mayo Robson finds it also in 59 per cent. of his cases, Moynihan in 72 per cent. and a Russian authority, Shaperko, in 90 per cent. Many of the French surgeons assert that every case of cancer is necessarily preceded by ulcer. Why is it not better, therefore, to excise all ulcers of the stomach, or at least those which are hard and callous and situated in the pyloric region and which constitute about 80 per cent. of cancers of the stomach. We cannot escape the conclusion that there must be a close etiologic connection between benign and malignant ulceration of the stomach, and that the time to cure cancer is when it is still a simple ulcer. This can be done with a very small mortality. I believe, and have believed for many years, that we shall live to see the time when all ulcers that are not bound down by prohibitive adhesions to the pancreas, gall-bladder, the large intestine, etc., will be promptly excised. I have followed this practice for the last thirteen years.

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[7] Meyer: Tr. Am. Surg. Assn., xxviii, 1910, p. 329.

[8] Haberkant: Quoted by Paterson: The Surgery of the Stomach, p. 43.

[9] Mikulicz: Tr. Cong. Am. Phys. and Surg., 1903, vi, 55.

[10] MacCarty, W. C., and Blackford, J. M.: Involvement of Regional Lymph-Nodes in Carcinoma of Stomach, Ann. Surg., June, 1912, p. 811.

[11] Gould, A. P.: Treatment of Inoperable Cancer, Lancet, London, Jan. 25, 1913, p. 215.

[12] Wölfler: Centralbl. f. Chir., 1881, No. 45.

[13] Hartmann: Arch. gén. de méd., 1900, iii, 562.

Dr. John B. Deaver. *Philadelphia:* As Dr. Mayo's statistics show, cancer of the stomach is a curable disease if taken in the curable stage. Dr. Mayo has shown that there is practically no mortality (0.6 of 1 per cent.) in an exploratory operation. This is a strong argument and one that should appeal to us. To perform an exploratory operation is practically taking no risk at all and, as Dr. Mayo also said, it is the final test. I was glad to hear Dr. Mayo's statement that roentgenoscopy has been of service in aiding early diagnosis and in showing the extent of the disease in certain cases.

Dr. John A. Lyons, *Chicago:* I wish to add to the dis-ssion this much: I sent a friend of mine to Rochester about o months ago for the removal of a cancer. The abdomen s opened, and it was discovered by Dr. Mayo that there was no cancer, but an ulcerated condition of the stomach. Dr. Mayo informed my friend that in six weeks he would be as well as ever. Cancer of the stomach had been the diagnosis of several surgeons in Chicago. The patient of whom I speak had lost 46 pounds and he is well to-day and has a fair prospect of living many years.

Dr. W. J. Mayo. *Rochester, Minn.:* I think we all occasionally make the mistake in certain cases of treating as ulcer a lesion which afterward proves to be cancer. It is difficult to determine, by the ordinary methods of diagnosis during operation, whether a certain gastric ulcer is benign or malignant. Unless we can procure a piece of tissue for diagnosis we must be guarded in our statements. The opposite mistake also occurs. In our clinic several patients on whom palliative operations were done for supposed hopeless gastric cancer remained well for more than five years. The operations were done for the relief of obstruction. We cannot, therefore, blame the medical man for not always making a diagnosis of cancer of the stomach, as he must employ indirect methods when we sometimes fail with direct ones. In the examination of these patients one should keep at least four things in mind: First, is there a tumor and is it movable? Repeated examinations should be made if in doubt; second, food remnants in the gastric content; third, Roentgen-ray bismuth photographs; fourth, examination of test-meal, etc.

EXPERIMENTAL TRANSPLANTATION OF INTESTINE AFTER EXTENSIVE EXCISION OF THE SIGMOID [*]

J. SHELTON HORSLEY, M.D.
RICHMOND, VA.

This subject was suggested to me by a case that came under my care about five years ago. The patient was a colored man, a deaf mute, who had been suffering from obstruction of the bowels for several days before admission to the hospital. He was enormously distended and his condition was desperate. Operation was done under cocain and a volvulus of the sigmoid found. The sigmoid was twisted and so distended that it resembled a large cyst. The volvulus was excised and after removing the diseased bowel it was impossible to approximate the lower end of the large intestine to the small portion of the descending colon that was left. An artificial anus was formed. The patient recovered and left the hospital about four weeks after the operation. He was very ignorant and could not properly take care of himself. His condition was pitiful in the extreme.

The necessity for excision of the sigmoid occurs not infrequently. Sometimes it should be so extensive that the ends of the bowel cannot be united. The chief conditions that render this necessary are volvulus, ulcers, or malignant tumors. The sigmoid may be secondarily involved by growths of the ovary or uterus so that its excision is necessary either from extension of the growth or from interference with the nutrition of the sigmoid. Sometimes it is so entangled in inflammatory products, or affected by benign ulcers, tuberculous or dysenteric, that extensive excision is advisable. In a few cases of dysentery in which absolute rest is indicated for the ascending and transverse colon and excision demanded for the sigmoid, an operation which would accomplish this and at the same time do away with the necessity of an artificial anus would be desirable.

Bearing these points in mind, I have been working experimentally on the problem. All the experiments have been done on dogs and the operations have been performed under full ether anesthesia. Every precaution was taken to prevent pain and suffering to the animal, and no more experiments were done than seemed necessary to prove the point in question.

In the first experiment, part of the sigmoid was excised and a section of the ileum four and a half inches long was transplanted. According to some previous experiments[1] it seems proved that if as much as 4½ inches of the small intestine be devascularized entirely and the omentum wrapped around it, nutrition will be maintained. So this amount of the ileum was removed and transplanted where a portion of the sigmoid had been excised. The segment was surrounded by omentum which was held in position by a few silk sutures. The dog died in twenty-four hours, and postmortem showed that the transplanted segment was completely gaugrenous. The technic was then varied so that about four inches of the ileum was resected leaving its mesentery attached. The ileum was reunited and its resected portion transplanted to take the place of the excised sigmoid. After the suturing was done, the mesentery of the transplanted section of the ileum was cut and the segment surrounded by omentum. The dog lived nine days. Postmortem showed that while most of the transplanted bowel had lived there were perforations in several places and general peritonitis. The ileum was next transplanted in the manner just indicated except that its attached mesentery was left intact. About 2 inches of ileum were transplanted. This dog died in four days and the condition of the intestine was quite similar to that found in the second experiment.

From these experiments it seemed that the transplantation of a segment of small intestine to take the place of a defect in the sigmoid was not satisfactory because the ileum, being smaller in diameter than the sigmoid and not prepared to resist the impact of the hard, dry, fecal masses gave way under the new conditions, ulcerted and perforated. In order to overcome this, it would be necessary to deliver the fluid fecal contents directly into the distal end of the excised sigmoid. This was accomplished in nine experiments in the following manner: The ileum was cut across at the ileocecal valve and transplanted into the distal end left after excising the sigmoid. The end of the descending colon, or upper stump from the excised sigmoid, was then drained by a lateral anastomosis into the ileum. (Fig. 1.) The advantages of this operation are apparent. The fluid fecal contents are delivered directly into the lower stump of the sigmoid without any undue friction on the transplanted ileum. The remaining portion of the large bowel has its secretions drained into the ileum and at the same time acts as a reservoir. If the fecal current is delivered too rapidly, the bowel can hold some excess feces and so prevent the chronic diarrhea which is frequent and often serious after total excision of the large bowel. Excision of the cecum, ascending and transverse colon, or the necessity for draining them by an external opening is obviated by this operation. The procedure is comparatively simple—merely cutting across the ileum, transplanting it to the sigmoid end-to-end and then a lateral anastomosis of the end of the large bowel to the ileum higher up. This can be done quickly when compared with such prolonged operations as total excision of the large bowel, is less dangerous, and, on the other hand, does not require an artificial anus, or any secondary operation as would be the case if the large bowel were drained externally.

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[*] Read in the Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

[1] Horsley, J. S.: The Journal A. M. A., Aug. 12, 1912, p. 597; and Ann. Surg., April, 1913.

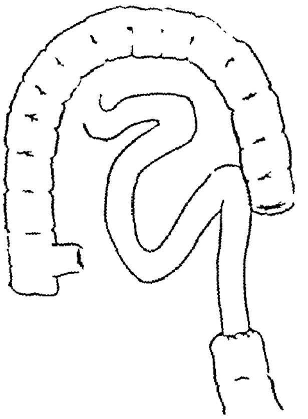

Fig. 1.—The sigmoid has been resected. The upper stump has been closed by invagination, the ileum cut across near the ileocecal valve, and its distal end closed by invagination. The ileum has been sutured to the distal portion of the sigmoid end-to-end and the descending colon is drained into the ileum by a lateral anastomosis. In this way, the defect left by excising the sigmoid is bridged over by transplanting the ileum, and the secretions from the large bowel are drained into the ileum.

Of the nine dogs operated on, six survived and were killed by chloroform, 84, 68, 48, 50, 47 and 54 days, respectively, after the operation. The openings were satisfactory and the intestine was well nourished in each case. Adhesions were always present though there was no evidence of obstruction. In one specimen there was a small abscess near the stump of the descending colon; this stump had been simply ligated without invagination. In two dogs of the series, the bowel ends were sutured and invaginated as described below; both the specimens were satisfactory though there were some adhesions. Of the three deaths, one occurred from perforation of the ileum just opposite the site of the lateral anastomosis by a large piece of bone sixty-one days after operation. The bone was jagged and caught in the lateral opening and was held firmly, a sharp spicule perforating the ileum. Both of the other fatal cases were due to leakage at the stump where simple ligature without invagination was used. One dog did not die till forty-three days after operation. An abscess had probably formed at the stump of the colon and been localized for some time before rupturing. Post-mortem showed leakage at the stump of the colon with general suppurative peritonitis. The third dog died two days after operation. Post-mortem showed leakage at the stumps of colon and ileum, and peritonitis

The steps of the operation in order are: excision of the sigmoid, closure of its proximal stump, division of the ileum about 2 inches from the ileocecal valve, closure of its distal stump, union of the ileum to the lower end of the sigmoid, and lateral anastomosis between the ileum and descending or transverse colon. The details of these steps are important and will be discussed fully. Let us first consider the technic of closing the bowel ends. This is done at the end of the descending colon and at the distal stump of the ileum. I first tried Lilienthal's method of simply ligating firmly the bowel ends just as in ligating the pedicle of a tumor. This is quick and simple and works nicely in appendectomy. In the experiments, it was found that two of the seven dogs in which the ends were merely ligated, died from leakage at the stump of either the ileum or colon. This seems due to the fact that although the ligatures may be tied tightly the muscular coat is so thick and heavy the ligature gradually cuts and becomes loose. The powerful peristalsis of the dog's bowel also tends to loosen the ligature. In the dog a simple ligature of the bowel end is unsafe. The method of closing the bowel ends that was found satisfactory was to place a stout overhand suture in the margins of bowel ends, going through both walls at the same time. No deeper bite should be taken than is necessary for a secure hold and the stitches should not be too close together. The ends of the suture are then tied tightly together, making only one knot. The ends of the suture may be caught with a hemostat and used to steady the bowel while inserting a purse-string suture, or the purse-string may be placed at what is thought to be the proper place before the bowel is divided. The purse-string suture should be placed not more than half an inch from the end of the bowel, for if placed farther away invagination is more difficult. After invagination of the bowel ends and tying the purse-string suture, the next step is the union of the ileum to the lower end of the sigmoid.

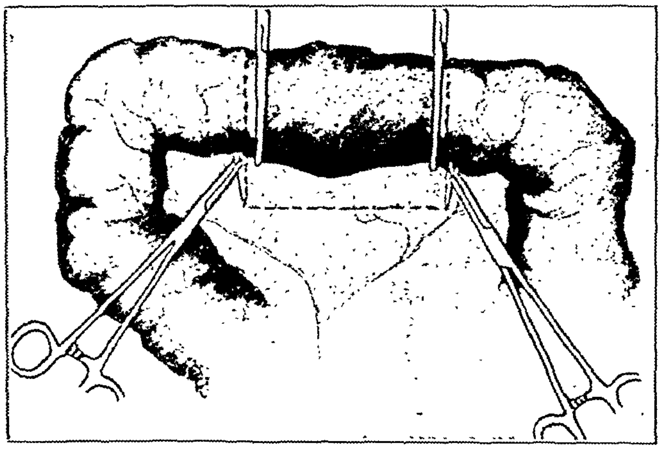

Fig. 2.—Before the bowel is divided, its mesentery is cut close to the bowel wall and the triangular space, caused by separation of the layers of the mesentery just before they cover the bowel, is clamped with a hemostat and ligated with silk or linen. This area is composed of areolar tissue rich in blood-vessels and lymphatics which absorb quickly, and even though it is closed off after it has been inoculated, the germs are merely sealed in and are likely to cause breaking down of the union at this point later on. The procedure indicated in the cut obviates this and also brings together the peritoneum at this point.

Because of the short end of the sigmoid that would be left after a wide excision, the union here is best done end-to-end, and not laterally. As fluid feces will be delivered by the ileum directly at the point of union, there seems no reason why the end-to-end union should not be made as in the small bowel, though for additional safety in man a rubber tube might be placed from the anus to the point of union and fastened in place for a few days by a catgut suture. The method of end-to-end union that has proved satisfactory in all these cases is one that I have been using for more than eight years. Before the bowel is divided, the mesentery is cut close to the bowel wall, and the triangular area where the mesentery separates is grasped with a hemostat and ligated with silk or linen (Fig. 2.) The objection chiefly urged against end-to-end union of bowel is that healing is difficult at the mesentery border and the cause of non-union is ascribed to lack of peritoneum. This may be true, but it is probable that infection of this area is also the cause of many failures. It is the usual practice to divide the bowel from the free border to the mesenteric border and the knife or scissors that cuts the septic mucosa also cuts through this triangular area, which is areolar tissue rich in blood-vessels and lymphatics. After this area is inoculated in this manner, it is the usual practice to close it, thereby sealing in bacteria that are likely to cause infection and non-union later at this point. By adopting the step mentioned above, this area is covered with peritoneum and, what is more important, its blood-vessels and lymphatics are closed before the septic bowel is opened. The bowel is then divided and its ends cleaned with moist antiseptic gauze. The first stitch begins in the end of the bowel at the operator's right-hand, about one-third of an inch from the mesenteric border. It is a mattress stitch and starts from the mucosa of the right bowel penetrating all coats. Then the needle is carried across to the left end of the bowel and penetrates all coats, entering on the peritoneal surface and emerging from the mucosa. It comes back in the reverse direction, entering the mucosa of the left bowel end and emerging on the peritoneal surface, then enters the peritoneal surface of the right bowel emerging from the mucosa. The thread is tied leaving an end about four inches long which is clamped with a light hemostatic forceps. The needle is then passed back and forth through all coats of the bowel, suturing away from the operator, making a continuous mattress stitch. Care must be taken to include a portion of the mesentery that has been tied, else it will slip back and will not be included in the suture. Each suture here must be very snugly approximated. After about one-third of the circumference of the bowel has been sutured, the needle emerges from the lumen of the right end of the bowel, and is thrust through all walls of the right end, appearing on the peritoneal surface (Fig. 3). The stitch is continued as a right-angle stitch penetrating all coats (Fig. 4). Snug approximation should be made with each stitch and at about every fourth stitch a back-stitch should be taken in order to prevent the thread from drawing too tightly and so diminishing unduly the caliber of the bowel. This is done by taking two stitches on the same side, the last one being slightly farther back than the preceding stitch. In this manner it is impossible to draw the thread too tightly. It is very important to have the first third of the suture line that unites the mesenteric border drawn tightly, but after this unless the back-stitch is taken at intervals, pulling the thread may diminish the lumen so much as to produce obstruction.

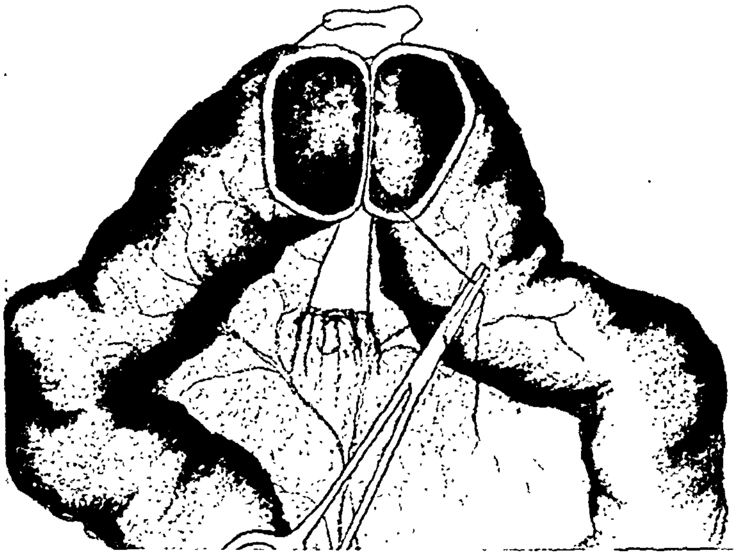

Fig. 3.—The first stitch starts in the end of the bowel at the operator's right hand about one-third of an inch from the mesenteric border. It is a mattress stitch and penetrates the wall of the right bowel from within out. The needle is then carried across to the left end of the bowel and penetrates all coats, entering on the peritoneal surface and emerging from the mucosa. It comes back in the reverse direction, entering the mucosa and emerging on the peritoneal surface, then enters on the peritoneal surface of the right bowel and emerges on the mucosa. The thread is tied, leaving an end about four inches long which is grasped in hemostatic forceps. The needle is then passed back and forth through all coats of the bowel, suturing away from the operator, and making a continuous mattress stitch. After about one-third of the circumference has been sutured, the needle emerges from the lumen of the right end of the bowel and is then thrust through all walls of the right end from within out, appearing on the peritoneal surface of the right end. The stitch is then continued as a right-angled suture penetrating all coats of the bowel.

The suture is continued toward the operator and is carried a short distance, about a stitch, beyond the lowest point where the original thread left when the knot was tied comes out. This last stitch should be taken in the left-hand side of the bowel. The thread is then tied firmly to the original end that is grasped in the hemostat. The knot should be tied parallel to the line of suturing so as to sink in easily and should be tied quite snugly. If a back-stitch has been taken at proper intervals, there is no danger of reducing the lumen by tying this knot too tightly. It had best be tied three times and then cut short; the ends will disappear within the bowel.

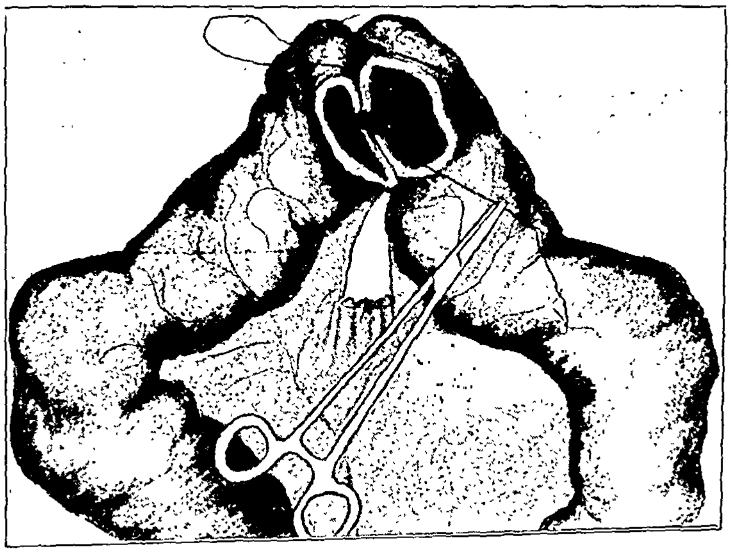

Fig. 4.—The suture is continued, inverting the bowel edge as it goes. A back-stitch should be taken at every fourth stitch. This is done by taking two stitches on the same side, the last one being slightly further back than the preceding stitch. This makes it impossible to draw the threads so tightly as to cause puckering and too great diminution of the lumen of the bowel.

This method is simple, leaves all knots within the bowel, and I have never seen a leakage from it when it was properly used. The danger of obstruction to the lumen is obviated by putting in occasional back-stitches and by properly approximating each stitch as it is made. The thread is all practically buried, leaving almost no thread exposed on the peritoneal surface, and the whole suturing can be done very quickly. All of these features are important and particularly so after a rather extensive operation such as transplantation of the bowel after resection of the sigmoid.

The next step to be considered is the draining of the large bowel. This is best done by a lateral anastomosis between the end of the descending colon and the ileum at such a point above its junction with the lower portion of the sigmoid as to provide against any undue tension. The lateral anastomosis can be used according to the technic of a gastro-enterostomy. A rubber-covered clamp is placed across the colon about four inches above its stump and another similar clamp grasps the ileum laterally. The union is made as close to the end of the colon as possible. After thoroughly packing off the surrounding structures, one stitch of silk or linen is taken at the upper portion of the proposed lines of incision into the intestines and the suture tied and left long. This fixes the ileum and colon together. An incision is then made into each and the bowel cleaned out with moist, antiseptic gauze. The bleeding points, if spurting, are clamped and tied taking a small bite of tissue. The bowel is united by a continuation of the first stitch which is applied quite snugly and each stitch locked as in the button-hole stitch. When the lower end of the incision is reached, the suture is converted into right-angled stitch penetrating all coats, and about every other stitch is locked after the manner of the button-hole stitch. The end is then tied to the original end which was left long and grasped with the forceps.

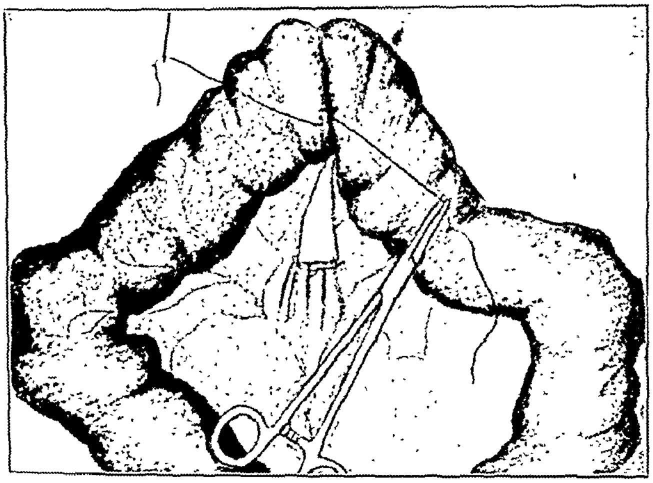

Fig. 5.—The suturing has been completed, the last stitch being taken in the left end of the bowel slightly beyond the lowest point where the original end of the thread comes out. The knot should be snug and should be tied parallel to the line of sutures so that it will sink in easily. The ends should be cut short and will sink into the lumen.

This suture has always been satisfactory, it is practically buried throughout its course, and it saves an apparently unnecessary second suture. It is done with a curved needle. One row seems all that is necessary here and makes less flattening of the bowel. If the operator prefers, however, there is no serious objection to following the identical technic of a gastro-enterostomy and using two rows of sutures.

ABSTRACT OF DISCUSSION

Dr. C. E. Ruth, Des Moines, Iowa: The function of the large intestine is to absorb a large portion of the solid matter. To overcome the difficulty which may be caused by the small intestine carrying the fecal current of the colon it may be necessary to make the anastomosis in the side of the colon. In intestinal anastomosis one point of danger is due to the divergence of the mesentery, and the next point of greatest weakness is that most distant, because of the lessened blood-supply. Another thing that should be kept in mind is that in the union of these two points with an angulation like that when the end-to-end anastomosis is made, there is not the slightest risk of contraction of the lumen of the intestine, but you can make the angle greater. The tendency is to a lesser degree of caliber rather than to a greater when an end-to-end anastomosis is made.

Dr. A. Goldspohn, Chicago: One feature in technic in favor of side-to-side anastomosis is that an aseptic field for work is preserved to the last moment, when the second intestinal lumen must be opened, because both ends of the bowel first cut in two have been turned in and closed. When the first bowel is severed with a cautery, however, as mentioned by Dr. Horsley, the same advantage can be secured for an end-to-side anastomosis by cutting off the eschar from the used end of the first bowel finally at the same time that the lateral incision is made into the second bowel involved—both being done after the posterior row of seroserous stitches has been placed. I had occasion to do this recently in an ileo-sigmoid anastomosis in a young woman who had an extreme elongation and descensus of the transverse colon, after three previous abdominal sections. The amount of digestive disorder (sometimes accompanied with much pain) experienced in that case for about eight weeks after this exclusion of the large bowel suggests careful deliberation before taking this step. The technic of circular enterorrhaphy—which Dr. Horsley describes and which he has published before, I have found to be practical and more simple than that of Dr. Connell.

Dr. J. S. Horsley, Richmond, Va.: It is true that some fecal matter accumulates in the large bowel, but not a large amount, and even that amount is to some extent obliterated by the constant flow of liquid feces. The part that does become hard is softened by the constant flow of liquid feces and peristalsis is carried on. The point is well taken. The description was merely diagrammatic.

THE HEALING PROCESS OF OSTEOSARCOMA UNDER THE INFLUENCE OF THE ROENTGEN RAYS [*]

GEORGE E. PFAHLER, M.D.
PHILADELPHIA

The healing process of osteosarcoma is very similar to that observed in the healing of any other bone disease, and consists of a bone sclerosis. This is indicated by a progressive deposit of lime salts in the tumor area. This process continues over a period of from several months to a year or more, and progresses long after the roentgenotherapy has been discontinued. The deposit of lime salts does not depend, therefore, on stimulation by the Roentgen rays, but is simply Nature's method of replacing the tumor tissue which has been destroyed by their action.

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[*] Read in the Section on Pharmacology and Therapeutics of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

[*] The subject originally announced was "Good Results Obtained in the Treatment of Sarcoma," but I found that this subject would make my paper too long, so I have limited myself to this one group of sarcomas. Owing to lack of space this article is here abbreviated by the omission of four case reports which are included in the Transactions of the Section and the author's reprints.

It is well known that the rays cause a granular degeneration of tumor-cells before affecting the surrounding healthy tissue-cells, probably because of their lower degree of vitality or resistance. This effect is due to the chemical action of the rays absorbed, just as these rays show their chemical action on the silver salts on photographic plates, on the glass of a Roentgen-ray tube and on the lead-glass shields which are used around the Roentgen-ray tubes for protection. These chemical effects can be observed any day, in any Roentgen-ray laboratory. If such chemical changes will take place in inorganic materials, and especially in such a stable product as glass, on which most of our strongest chemicals have no effect, it is not strange that a most decided chemical effect should be observed in tumor-cells, which are organic and less well organized and therefore less stable than the healthy tissues of the body.

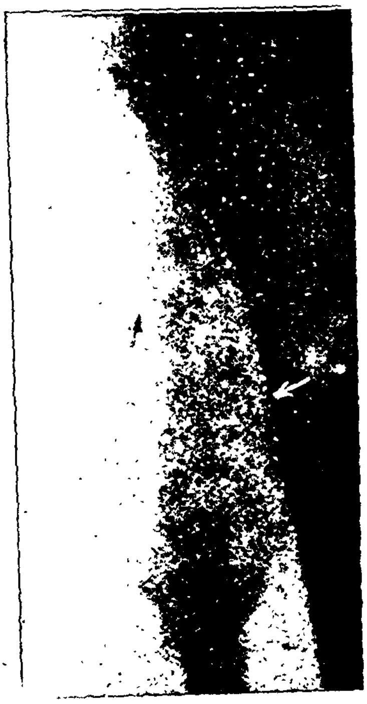
Fig. 1, Case 1.—Absence of lime salts in sarcoma area is shown. Dark arrow points to the area from which a section was removed March 3, 1906. (Plate reversed by printer.)

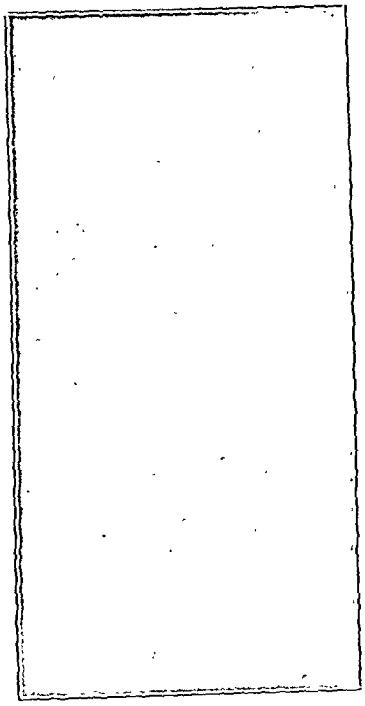
Fig. 2, Case 1.—Notice beginning calcification under the periosteum or periphery; also slight contraction of the tumor area at the end of a month (April 7, 1906).

The good effects of the Roentgen rays on sarcoma, according to my observations, have been more marked in osteosarcoma than in sarcoma involving other tissues of the body; and of the osteosarcomas, the medullary or central type responds best. Remarkable results, however, are often obtained in sarcoma of the soft tissues. When one realizes that all chemical and biologic effects of the rays depend almost entirely on those which are absorbed and not on those which pass through, it will not be surprising that the most marked effect should be observed in bone tumors, since it is a well-known fact that the bones absorb many times more rays than any other tissues of the body. This is seen clearly in every roentgenogram. In fact, the bones absorb all of the soft, and most of the hard, rays. Therefore, we can use rays that will easily pass through the soft tissues and in them produce little or no effect (because they are not absorbed), while a most marked effect will be produced on the bone tumor because they are absorbed. A secondary effect of the rays is that due to the secondary radiations, which is similar to that produced by the primary radiations. The quantity of secondary radiations given off from any element corresponds roughly to the density of the element. Therefore, since bone is more dense than any other tissue of the body, even the secondary radiations and their effect will be greater than in the soft tissues. I have discussed this phase of the subject because many might be surprised and incredulous, on account of the popular medical opinion that the rays are useful therapeutically only in superficial affections.

The diagnosis of osteosarcoma can be made, and the healing process can, fortunately, be beautifully observed by means of the Roentgen rays. This is especially true in the study of the long bones. The characteristic pathologic appearance of osteosarcoma is when briefly expressed, a decalcification without sclerosis, but associated with new growth. If the tumor is a central sarcoma of a long bone, it is seen to have destroyed the cancellous structure locally, and this appearance is gradually shaded into the healthy bone-tissue. The total diameter of the bone is likely to be increased, and, if advanced, the wall of the bone will be seen to have broken through and the soft tissues to have become involved. If it is a peripheral sarcoma, the tumor-tissue which early infiltrate the soft tissues will be seen to lift the periosteum in a spindle form, and may have infiltrated only the surface of the bone.

All of these cases that I have studied and treated belong to the central or mixed type. In the healing process there is a gradual increase in the amount of lime salts, and this deposit seems to proceed from the periosteum. When the treatment is successful, the entire tumor area becomes infiltrated with lime salts, until it is as dense as normal bone. The size of the tumor area is usually somewhat reduced, but I believe never returns to normal. In one case (No. 3) there seemed to be no reduction in the size of the tumor, but with the increase of lime salts in the tumor area the patient's symptoms disappeared.

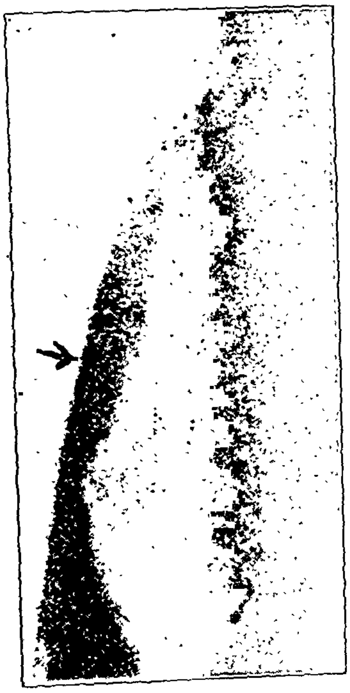
Fig. 3, Case 1.—Notice increase in the calcification at the end of the second month of treatment (May 3, 1906).

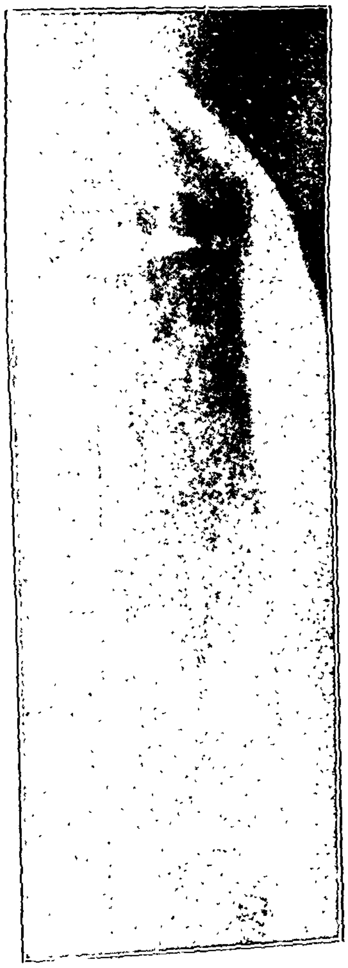
Fig. 4, Case 1.—Notice complete calcification at the end of six years (April 5, 1912). (Plate reversed by printer.)

The cancellous structure never attains a normal appearance, but presents a collection of lines without definite order. This sclerotic area is then more dense than normal bone. I have found that these areas continue to become more dense for a considerable time after the roentgenotherapy has been discontinued, but that they attain approximately normal density within a year.

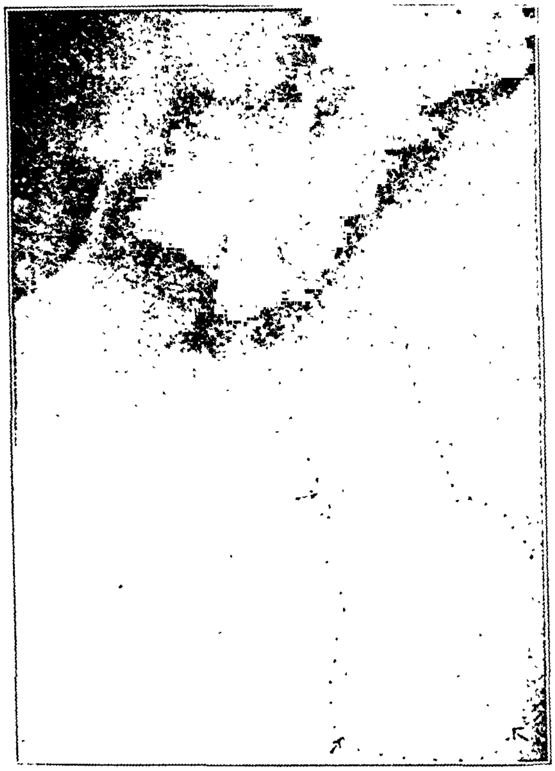

Fig. 5, Case 3.—Osteosarcoma of pubes and ischium. Shows the disease in the bone and the tumor extending 6 inches down the thigh, which is only slightly more dense than the soft tissues (Feb. 12, 1912).

It has been my privilege to study a number of cases of osteosarcoma by means of serial roentgenograms made during the course of treatment and from one to seven years afterward. These cases are reported not in the order of occurrence, but more particularly in the order in which they are most instructive, and chiefly with reference to the locality involved.

REPORT AND DISCUSSION OF CASES

CASE 1 (Figs. 1, 2, 3 and 4).—Miss L. B., aged 18, was referred to me by Dr. M. P. Warmuth, March 5, 1906. She had bruised the upper portion of the left leg ten months previously, and on this area a painful tumor developed. Feb. 20, 1906, a roentgenoscopy showed the upper 9 cm. of the fibula swollen to a diameter of 3 cm., or three times the diameter of the normal shaft of the bone. This diseased portion apparently contained no lime salts. It showed no medullary cavity, but in the upper portion could be seen a cavity about 1.5 by 1 cm., which was produced by the removal of a section for microscopic examination. Otherwise the tumor was uniform in consistency and showed only slightly more density than muscle. The diagnosis of osteosarcoma was made. Microscopic examination in the pathologic laboratory of the Medico-Chirurgical Hospital showed the tumor to be a round-cell sarcoma.

Amputation at the middle of the thigh was advised, but was refused. Roentgenotherapy was then advised and begun March 5, 1906. The patient was treated six times a week for six weeks; then three times a week for three weeks. In all she was given forty-seven treatments in three months. She has not been treated since then and is still perfectly well, seven years afterward.

A series of roentgenograms were made Feb. 20, April 7 and May 3, 1906, and Aug. 8, 1907, April 27, 1908, and April 5, 1912. These studies show a progressive increase in the quantity of lime salts, beginning first by a deposit beneath the periosteum covering the tumor, or at least at its periphery, and gradually extending into the center, so that at the time of stopping treatment the bony periphery was about ⅛ inch thick. At the end of fourteen months the tumor had approximately the density of the normal bone, but showed a number of elongated small cavities, which probably replaced the medullary cavity. It was then reduced to about two-thirds of its original size. Since that time there has been no appreciable change.

This case shows the following interesting points: 1. The clinical, roentgenologic and microscopic diagnosis was of sarcoma. 2. It was clearly an osteosarcoma of the medullary type. 3. The healing under the influence of the Roentgen rays began at the periphery and was indicated by a gradually increased deposit of lime salts, until it had reached the density of normal bone. 5. The tumor was only reduced to two-thirds of its original size. 6. The patient has remained well over seven years, during which time she has been married and has followed the ordinary affairs of life.

CASE 2.—Miss M. S., aged 23, was referred to me by Dr. Albert Cole of Indianapolis, March 29, 1909. Her right leg had been lame, stiff and painful since May, 1908. At the time of my examination by means of the Roentgen rays, she had a medullary or central sarcoma involving the upper 2½ inches of the fibula. The tumor was about four times the diameter of the fibula and showed no evidence of lime salts, except the faintest trace on one side. To all appearances the tumor seemed to be a duplicate of that in Case 1 except that it was more advanced. The patient refused operation absolutely.

She was treated with the Roentgen rays at intervals during a year, receiving about ninety exposures. There was

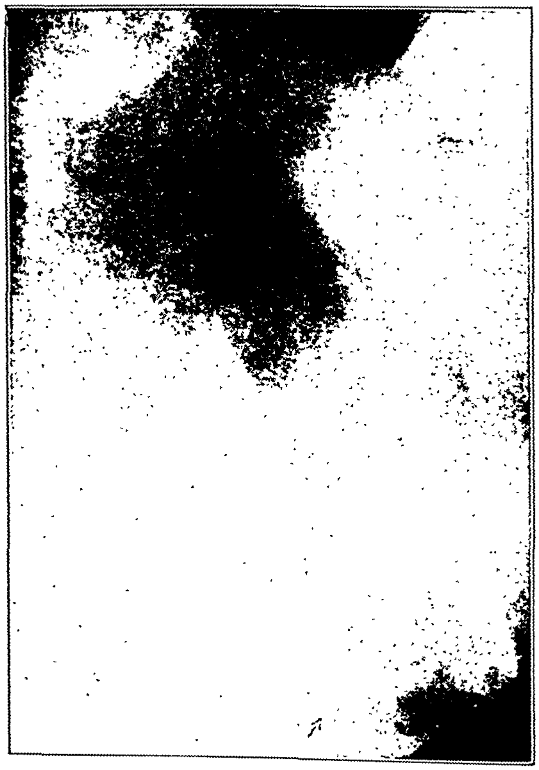

Fig. 6, Case 3.—Nearly complete calcification of the tumor (June 14, 1912).

slight increase in the lime deposit, but at no time definite evidence of reorganization. In May, 1910, the patient returned with definite evidence of fluctuation. She consented to have this incised and drained under promise that the leg would not be amputated. Incision showed an abundance of creamy pus, and Dr. Laplace, who operated, believed that it was tuberculous. The wound was curetted. Some of the scrapings were sent to Dr. Henry S. Wieder for microscopic study. He found the growth to be a spindle-cell and giant-cell sarcoma. Following the operation the patient developed some fever, and there was a continuous discharge of pus from the wound.

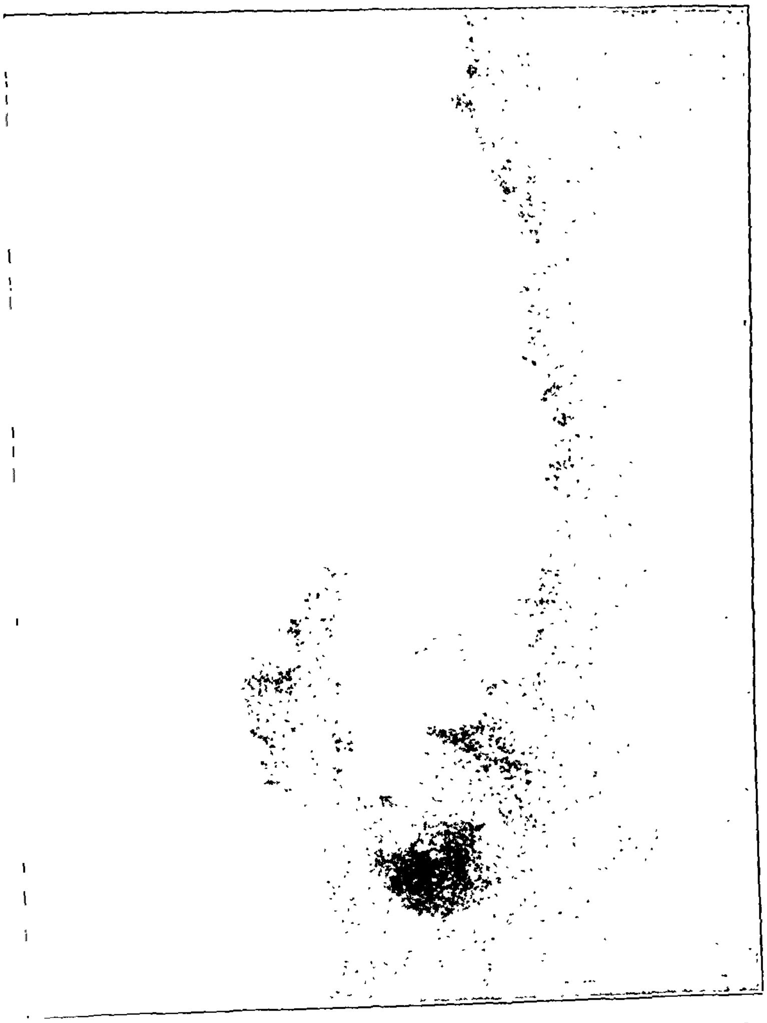

Fig. 7, Case 4.—Osteosarcoma of ilium. Notice fracture of the tumor (Jan. 6, 1909).

Repeated roentgenoscopies after the curettement showed a progressive deposit of lime salts, but little tendency for the wound to heal. The general appearance now was that of an osteomyelitis. Eight months after the curettement, Dr. R. F. Morris of Houston, Tex., wrote that the ulcer looked malignant, and had the appearance of an epithelioma. The patient then consented to an amputation of the leg and has remained quite well the two years since. The pathologic diagnosis by Dr. E. F. Cook was "myeloid sarcoma."

The points of interest in this case are: 1. The location and type of the osteosarcoma were almost duplicates of those in Case 1. 2. It was farther advanced, and probably did not have enough of the periosteum left to effect the deposit of lime salts. 3. The tumor degenerated into what seemed to be pus (a condition observed in another case of sarcoma of the soft tissues of the neck, which proved to be sarcoma). 4. The treatment probably helped to limit the disease since there has never been any evidence of metastasis in five years.

Case 3 (Figs. 5 and 6).—Mr. J. B., aged 39, was referred to me by Dr. John B. Deaver. Feb. 13, 1912, who stated, "I am morally sure that the growth is sarcoma and inoperable." The patient had at this time a growth infiltrating the anterior portion of the left thigh, about 6 inches long and 3 inches wide. He hobbled along with a cane, placing little or no weight on this leg.

Roentgenoscopy showed disease of the entire os innominatum below the middle of the acetabular cavity, or corresponding approximately with the ischium and pubes, and a bony tumor extending 6 inches down the thigh. The lime salts were almost completely absorbed in the diseased area, and the cancellous structure was entirely disorganized. The case looked like a hopeless one.

Roentgenotherapy was begun Feb. 15, 1912; and repeated daily at first, then three times a week, the patient receiving seventy-five exposures in all, during a year. He showed improvement at the end of three weeks, and in two months he was able to climb off and on a wagon and walked with only a slight limp. During the past fourteen months he has been driving a wagon regularly and now walks without the slightest limp, pain or inconvenience. To all appearances he is well. He has had repeated roentgenoscopies made at first at intervals of a month, and then less frequently. All showed a progressive increase in the deposit of lime salts, recognized at the end of the first month, and showed only slight increase after a year. The size and shape of the tumor showed practically no change. The surrounding tissues apparently accommodated themselves to the pressure of the tumor, so that it has given him practically no inconvenience. The skin showed no damage as a result of the roentgenotherapy.

This case is of interest because: 1. It involved the deepest bones of the body in a large muscular man. 2. It seemed hopeless from any other method of treatment. 3. Improvement was recognized both by the symptoms and by roentgenoscopies at the end of a month. The patient is apparently well sixteen months after beginning treatment.

Case 4 (Figs. 7 and 8).—H. G., a boy, aged 16, was referred to me for roentgenoscopy, Jan. 5, 1909, by Drs. Valentine Levi and H. C. Deaver. Five months previously while running a foot-race, he felt something snap in his right hip. He dropped to the ground, but in fifteen minutes got up and walked away. For a month after this accident any unusual movement gave him pain.

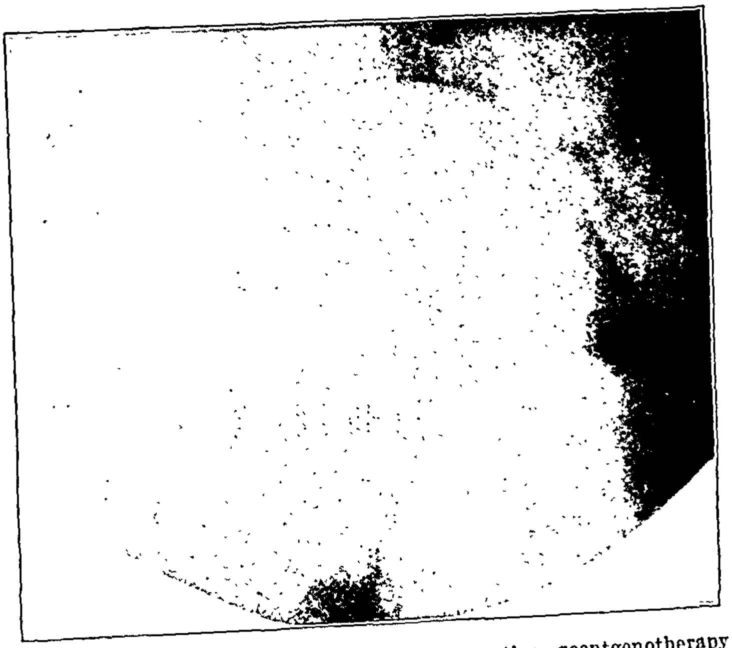

Fig. 8, Case 4.—After excision and active roentgenotherapy (July 8, 1909). (Plate reversed by the printer.)

Roentgenoscopies showed an osteosarcoma, about 2½ inches long and 1½ inches in diameter, growing from the ilium just above the acetabular cavity. This osteosarcoma was fractured during the foot-race five months previously (Fig. 7).

Dr. H. C. Deaver removed this osteosarcoma, Jan. 22, 1909, at the Stetson Hospital. Pathologic examination by Dr. Somers showed the tumor to be a giant-cell sarcoma at the center with spindle-cells at the periphery. During the first month after the operation Dr. Fisher gave twenty-one exposures of the Roentgen ray under my direction. During the next two months I gave sixteen treatments ending April 10, 1909. Since then, for over four years, the patient has remained perfectly well. He is at present traveling in Europe.

This case presents the following special points of interest: 1. The patient had no symptoms of the sarcoma which had developed until he fractured the tumor in a foot-race. 2. He suffered only occasional pain for five months afterward. 3. Excision followed by active roentgenotherapy has been followed by a cure lasting over four years.

CASE 5.—D. C., a girl, aged 14, was referred to me for examination by Dr. W. C. Batroff, Dec. 16, 1912. Nine months previously she injured the region of her left hip by a fall. Two days later a swelling appeared, which lasted two weeks. Two months after the injury the patient began to limp, and the hip became sore anteriorly.

Roentgenoscopy revealed no evidence of hip-joint disease or disease of the femur, but a large tumor shadow was found about the ilium, extending down over the hip-joint. The tumor contained no evidence of lime salts. I made a diagnosis of osteosarcoma.

Active roentgenotherapy was begun and continued over a period of three months; forty-four treatments were given, which were carried to the limit of skin tolerance. There was no evidence of deposit of lime salts; the tumor continued to grow until now its diameter is more than half the diameter of the body, and the patient is in the terminal stage of the disease. I believe now that the tumor is a chondrosarcoma, springing from the cartilage between the body and the epiphysis of the crest of the ilium, and because it is this type of tumor I have failed.

CASE 8.—E. B., a boy, aged 15, was referred for treatment by Dr. William L. Rodman, Oct. 29, 1902. He had been operated on by Dr. Rodman for osteosarcoma of the left side of the upper jaw two years previously. A recurrence, which now involved the entire anterior surface of the upper maxilla, had been noticed five months before he came for roentgenotherapy. He received sixty treatments in eight months. There was some reduction in the size of the tumor, and he has remained well now eleven years. The lower part of the left superior maxilla is still enlarged and very hard, but is quite well. The overlying skin shows some telangiectases.

CASE 9.—S. W., a boy, aged 9, was referred to me for roentgenotherapy, April 4, 1909, by Dr. Stillewell Burns. He had an osteosarcoma about the size of a peach stone in the right upper jaw, in the cuspid region. He had been suffering from pain for about two months. Roentgenoscopy revealed irregular destruction of the cancellous tissue, such as is seen in sarcoma. The patient was examined, and a section removed by Dr. M. I. Shamberg, April 24, 1909. He had been treated by the rays eight times preceding this section, and there was some reduction in the size of the tumor. Microscopic examination by Dr. H. S. Wieder showed it to be a spindle-cell sarcoma. He received 120 treatments (each treatment being two-tenths of a full erythema dose) in six months, when he seemed to be well. He has remained well for over four years. The cuspid tooth is twisted on its axis so that the cutting edge is at right angle to the normal, and there remains some thickening of the bone at this point, but otherwise nothing abnormal.

This case shows the following instructive points: 1. What at first seemed to be a benign epulis proved to be an osteosarcoma of spindle-cell type. 2. Surgical treatment, even if successful in removing the disease, would have demanded considerable resection of the jaw, with at least considerable deformity. 3. The healing process led to a twisting of the tooth but did not interfere with its growth and development. 4. The patient has remained well over four years.

CASE 12.—W. H., aged 7, was referred for treatment by Dr. D. B. Kreider, Aug. 22, 1911. During six weeks a tumor had developed in the left lower jaw in the region of the cuspid and bicuspid teeth. It was now about 1½ inches long, 1 inch wide, and elevated about ½ inch above the surrounding surface. A section examined by Dr. H. S. Wieder showed the tumor to be a giant-cell sarcoma. Roentgenoscopy showed a disturbance in the cancellous structure of the alveolar process and irregular absorption of lime salts. The patient was treated by the Roentgen rays fifty-two times in four months, each exposure *giving about two-tenths of an erythema* dose. At the end of this time he was apparently well. He has remained well eighteen months since, and I believe that he is permanently cured. He has no loss of tissue, no deformity, and simply has some displacement of two teeth which have erupted since the tumor has healed, and were either displaced by the growing tumor or by the sclerosis following the treatment. The cancellous tissue is slightly more dense than normal.

This case, like Case 9, shows: 1. Healing without interruption of the development of the teeth, but followed by some displacement. 2. Healing without damage to overlying or underlying tissue.

TECHNIC

A review of the brief reports of the foregoing cases will show that this treatment and these observations have extended over a period of eleven years; the technic has, therefore, undergone a progressive evolution, the duration of the treatment and the number of exposures being very much reduced in the later cases. For the sake of brevity I shall refer only to the principles governing the modern technic. These are:

1. The rays must have good penetration, or they will be absorbed by the overlying tissues before reaching the bony tumor. Even with the most penetrating rays the greater proportion will be absorbed by the superficial tissues. The most careful attention is therefore necessary to keep the tube in good condition during the entire treatment. The rays should have a penetration of from 7 to 8 of the Benoist scale.

2. The quantity of rays should be measured carefully during each application, and the limit of the erythema dose should be reached as quickly as possible, but should not be exceeded. The duration of each application and the frequency will depend on the individual operator's technic and apparatus, but when an erythema dose has been given at any one area of skin, this one area should receive no more treatment for at least two weeks. To measure the dose I use the Sabouraud pastille and the Holzknecht modified scale, or radiometer.

3. The skin should be protected by filters. For this I now use a piece of sole-leather ⅛ inch thick, and from 1 mm. to 3 mm. of aluminum. This, of course, decreases the total quantity of rays, but gives a greater proportion of penetrating rays in comparison with those absorbed in the superficial tissues. It must not be forgotten that a patient can be burned through filters, and a burn is always a disadvantage.

4. Cross-fire application of the rays consists in directing them toward the center of the tumor from as many angles and through as many different areas of skin as possible. In this way the proportional deep dose is greatly increased, and it is possible to make the dose in the tumor equal to that absorbed by the skin. With such technic massive doses can be given safely.

CONCLUSIONS

1. Osteosarcomas heal by a progressive deposit of lime salts in the tumor areas, until the tumor area attains the solidity and density of normal bone.

2. This process usually begins within a month and is progressive for a year or more, continuing long after the roentgenotherapy has been discontinued.

3. In the twelve cases treated, including the inoperable and recurrent, seven, or over 58 per cent. of the patients have completely recovered and have remained well from five months to eleven years. One other patient had nearly recovered, interrupted treatment, and remained free from symptoms five months, when a recurrence followed traumatism. In only one case was there no improvement.

4. Skilful treatment should be given in any inoperable case and should follow when operation seems advisable.

5. When operation will result in deformity or serious loss of bone, roentgenotherapy should be tried for at least a month.

6. The treatment should be given by some one who is familiar with the technic of deep roentgenotherapy.

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WHAT CAN BE DONE IN CANCER WITH ROENTGEN RAYS?*

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Undoubtedly the Roentgen ray as a therapeutic agent in cancer has lost ground in the estimation of the profession. It has gone through the familiar cycle: promise, exaggerated expectations and statements, disappointments and reaction. In the case of Roentgen rays the course has been particularly unfortunate; the agent lends itself so readily to sensational exploitation and its application is so outside the usual routine of medical and surgical procedure that many conservative men have neither undertaken to use it, nor—what is more unfortunate—made themselves familiar with what might be properly expected from it or with its actual results; while on the other side its haphazard application is so easy that many untrained men have used it with much damage to its reputation.

What are the facts? Is the skepticism concerning it a just and temperate judgment? Has it failed to live up to its early reasonable promise, or is it simply suffering from lack of appreciation and from ignorance in the minds of the profession of its actual accomplishments? To confine ourselves to the question in hand, has it proved an addition of any practical value in cancer—using that term to include all forms of malignant growth? Can anything practical be done with it that cannot be done by better established methods, or is it of so little use that it may be properly neglected in the treatment of our cases of cancer?

The most cursory observation leaves no doubt that Roentgen rays can destroy carcinoma tissue on the surface of the body. This is done most readily, perhaps, in basal-cell carcinomas—rodent ulcers—but it can be done also in typical squamous-cell epitheliomas. The statement is sometimes made that in true squamous-cell carcinoma, Roentgen rays will not destroy the lesions. In refutation of this, I have offered the accompanying case (Figs. 1 and 2), the first case of squamous-cell carcinoma (Fig. 3) that I treated with Roentgen rays. The patient remains well to-day, twelve years after healing, with the cosmetic result shown in Figure 3. I could offer scores of similar cases of squamous-cell carcinoma and as many of rodent ulcers. The accompanying illustrations of a few cases are selected as offering certain visible evidence of Roentgen-ray effects in cutaneous carcinoma (Figs. 4 to 7).

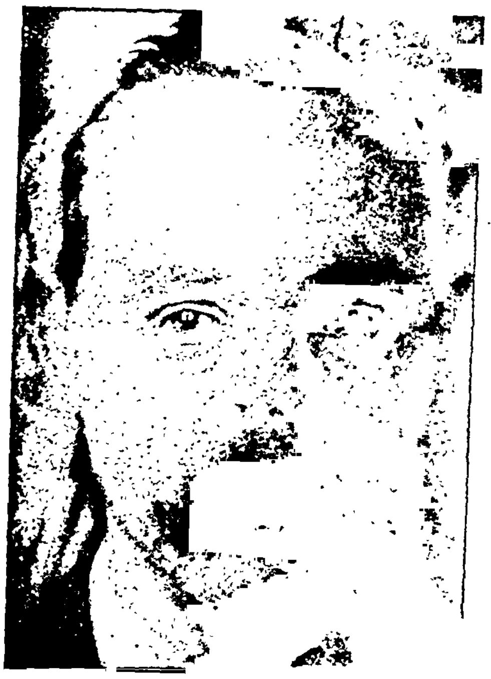

Fig. 1.—Squamous-cell epithelioma of the nose, May, 1901.

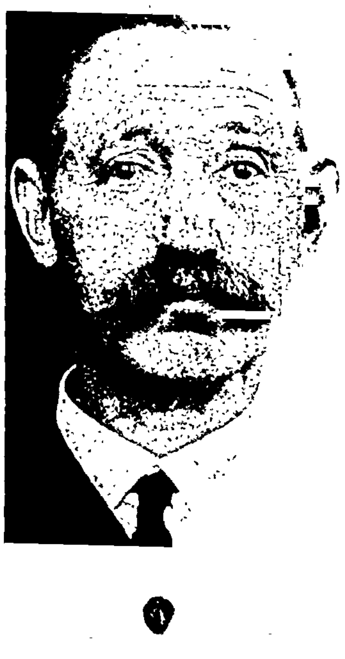

Fig. 3.—Result of Roentgen-ray treatment of lesion shown in Figure 1, March, 1912.

In my experience the type of epithelioma makes little difference; basal cell or squamous cell, any epithelioma on the surface may be destroyed with Roentgen rays. Some lesions yield much more readily than others; but this variability does not amount to complete resistance in any case, and the point I wish to make here is that epithelioma tissue in the skin can be destroyed by Roentgen rays with practical certainty.

If the applications are properly graduated, the carcinoma cells degenerate, disappear and are replaced by healthy scar tissue. Various men, including myself, have described the microscopic changes that occur in this process, so that I shall not delay to do it again here, but shall only call attention to the fact observed in sections taken during various stages in the process, that at the beginning we have carcinoma and at the end we have in place of it firm healthy scar tissue.

As to Roentgen rays in epithelioma I believe it may be said almost without reservation that any epithelioma which has not metastases and which has not deeply involved the subcutaneous tissue may be symptomatically cured by Roentgent rays. By symptomatically cured, I mean converted into healthy scar tissue, as healthy scar tissue as can be obtained after the excision of epithelioma. The superficial extent of the carcinoma is, of course, a factor of some consideration in the prognosis; but the most extensive epithelioma that I have seen I have symptomatically cured with Roentgen rays. I have seen lesions involving areas of from 30 to 40 or 50 square inches converted into healthy scar tissue.

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* Owing to lack of space this article is here abbreviated by omission of four photomicrographic studies of diseased tissues. These are presented in the Transactions of the Section and in the author's reprints.

* Read in the Section on Pharmacology and Therapeutics of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

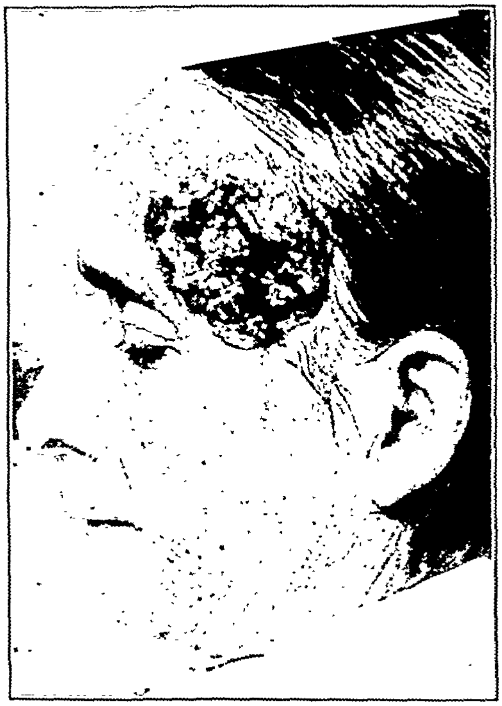

Fig. 4.—Epithelioma of face.

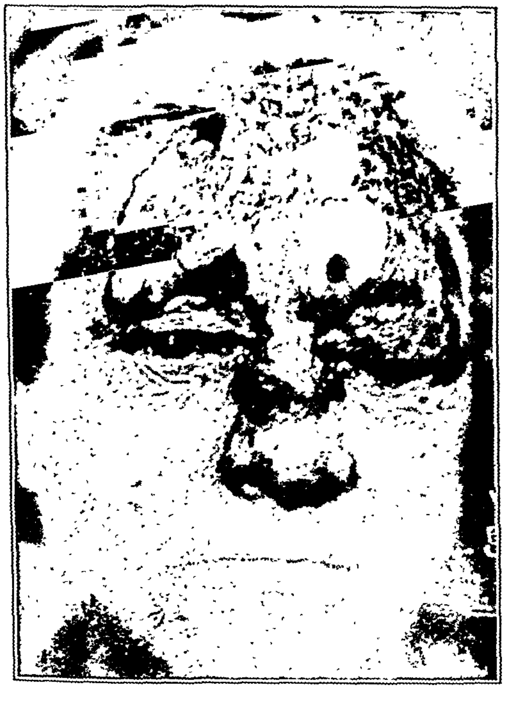

Fig. 6.—Epithelioma of temple.

When there is deep involvement of subcutaneous tissues, as in epitheliomas invading the orbit or extending down deep into the bones of the face, Roentgen rays may fail; but I have seen unexpectedly successful results in cases of this sort, as, for example, in epitheliomas involving the bones of the nose. When there are metastases in the contiguous lymph-nodes, Roentgen rays usually fail, but here likewise at times we have successful results.

As to the permanence of the results in epithelioma, some of my cases have gone more than ten years without recurrence, and I believe that whenever you are able to get a satisfactory scar you may count on a permanent result. As regards permanency of results, I believe the cases will bear a fair comparison with those treated by any other method. As to the range of application of Roentgen rays in epithelioma, it may, in my opinion, be said that any case of epithelioma is suitable for treatment with Roentgen rays in which, if a wise surgeon were

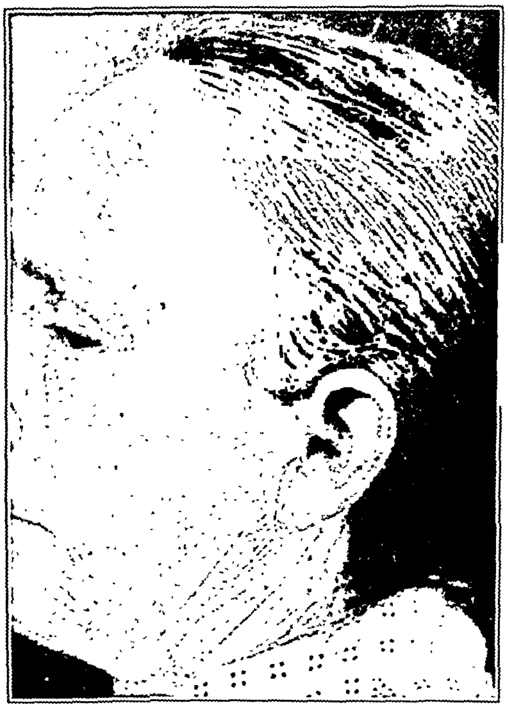

Fig. 5.—Result of Roentgen-ray treatment of patient shown in Figure 4.

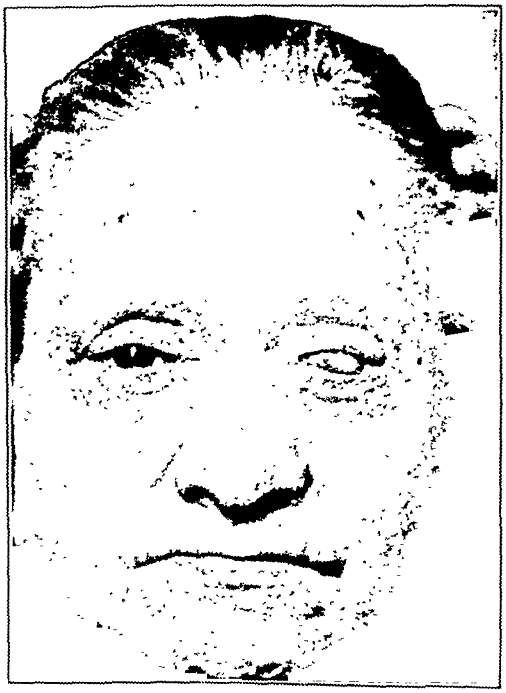

Fig. 7.—Result of Roentgen-ray treatment of patient shown in Figure 6.

operating, he would not feel called on to remove the contiguous lymph-nodes. If the case is one in which the removal of the contiguous lymph-nodes is indicated, it should be treated surgically, and not with Roentgen rays. That statement, I trust, covers the question of the treatment of epitheliomas of the lip with Roentgen rays.

The foregoing paragraph is a practical repetition of a statement I made seven years ago, and my longer experience makes me more than ready to stand by this position now.

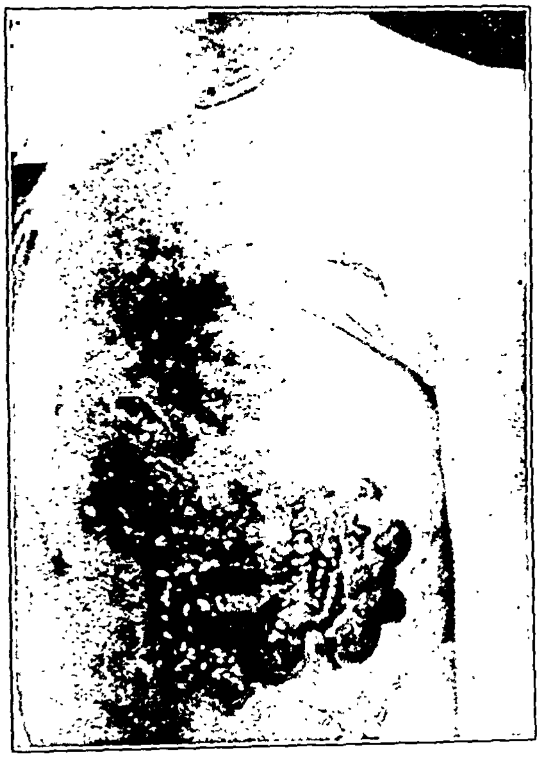

Fig. 11.—Recurrent carcinoma of breast.

But granting that epitheliomas on the surface can be destroyed by Roentgen rays, what evidence have we that deeper malignant growths can be affected? From my experience I can produce much evidence on this point, as can many other men who have used Roentgen rays in this field. Take the following cases for examples:

REPORT AND DISCUSSION OF CASES

Case 1.—Figures 11 and 12 show the effects in one of my earliest and most striking cases of recurrent carcinoma of the breast treated with Roentgen rays. In this case a great mass of carcinoma, recurrent after repeated operations by Dr. Christian Fenger, had entirely disappeared and been replaced by smooth, healthy looking scar tissue after four months of Roentgen-ray treatment.

Case 2.—Miss ——, aged 49, had the left breast removed by Dr. Nicholas Senn in February, 1900; this was followed by a recurrence which Dr. Senn removed in October, 1900. She had a second recurrence which Dr. A. J. Ochsner considered inoperable; he sent her to me for Roentgen-ray treatment in November, 1901. She had a dense deep-seated mass of carcinoma tissue involving the chest wall, with coin-size ulcer at two points. This all disappeared under Roentgen-ray treatment. Six months later she developed a hard mass under the nipple of the other breast. This also disappeared under Roentgen rays. This patient went on until 1907—nearly six years—without recurrence and in comfort, during all of this time occupying a laborious position of responsibility. In discussing this case in April, 1902, Dr. Ochsner expressed the opinion that she would surely have been dead at that time, but for the effects of Roentgen rays.

Case 3.—Mrs. ——, aged 45, referred to me by Dr. T. A. Davis, had the left breast removed for carcinoma in May, 1901. In spite of moderate prophylactic Roentgen-ray exposures, nodules appeared in the axilla, with swollen arm, early in 1902, and soon afterward there developed hard lymph-nodes in the supraclavicular space. Under very vigorous Roentgen-ray exposures, carried to the point of producing ultimately atrophy and telangiectasia of the skin of the areas exposed, all of the carcinoma masses disappeared, with the exception of small palpable masses representing the lymph-nodes. Although the condition had hitherto been regarded as inoperable, it was decided now to remove these lymph-nodes. On operation, instead of a mass of lymph-nodes infiltrating the jugular wall as had been feared, small masses of fibrous tissue were found which were easily dissected out without damage to the vessels. The patient was well nine years later and I believe remains so now. The inevitable natural career of such a patient is, of course, death in a period measured by months.

The following two cases of primary carcinoma of the breast are interesting in this connection:

Case 4.—Mrs. C. C., aged 45, was referred to me by Dr. C. Z. Aud of Cecilian, Ky., in January, 1902, with a diagnosis of carcinoma of the breast for which operation had been urged repeatedly but refused. There was a large nodular hard movable mass in the right breast, with retraction of the nipple. It had been slowly enlarging for four years accompanied during the last year by frequent shooting pains. The patient was exposed to Roentgen rays regularly from January to May, 1901, and had one series of exposures in June, 1903. The result was complete disappearance of the tumor and she is living and well to-day with a breast free from tumor—eleven years after coming under treatment.

Case 5.—A similar case was that of Mrs. C., aged 55, referred to me in October, 1902, by her son, a physician, and Dr. William E. Quine of Chicago with a diagnosis of carcinoma of the breast. In the right breast there was a lemon-sized nodular mass just beneath the nipple, which had been noticed two weeks before. One lymph-node was palpable in the axilla. Operation was refused. The patient had nearly a hundred Roentgen-ray exposures during a period of three years. I saw her living and well in February, 1910, eight years after. The breast tissue was perfectly soft, and there was no suspicious point, in either the breast or the axilla. I believe she remains well now.

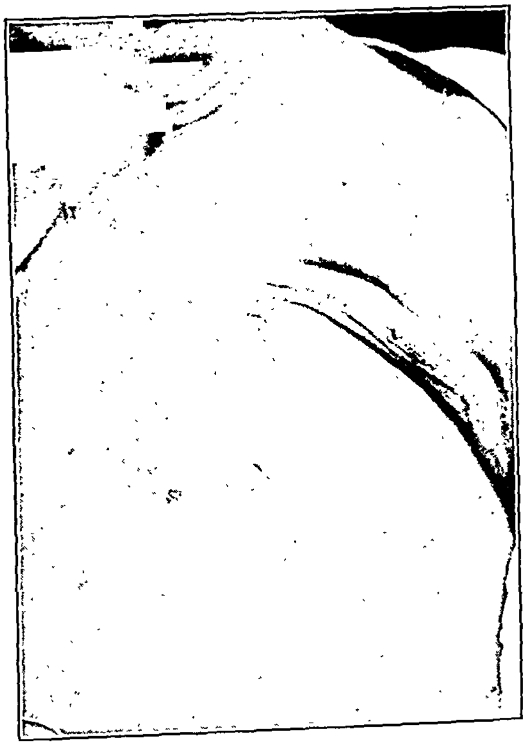

Fig. 12.—Result of Roentgen-ray treatment of case shown in Figure 11.

The clinical diagnosis of carcinoma was as clear as possible in both of these cases and they had been regarded as carcinoma by numerous competent consultants. These cases constitute two of the three cases of operable primary carcinoma of the breast which I have treated; the third was a failure. They are not recited as an argument in favor of using Roentgen rays instead of operation in operable cancer of the breast, but as evidence of deep-seated Roentgen-ray effect on cancer.

Similar evidence is furnished by the post-mortem findings in the following two cases:

CASE 6.—The first patient, an old woman referred to me by Dr. E. Wyllys Andrews of Chicago, had a large primary carcinoma of the breast without involvement of the skin, with enlarged axillary lymph-nodes, and with spinal metastasis when the treatment was begun. The patient had vigorous Roentgen-ray exposures lasting about a month, with the production of a dermatitis which subsided completely before her death, about three months after the treatment began. Post mortem it was found that the breast was a mass of connective tissue without any carcinoma tissue remaining. The same was true of the axillary contents; they were converted into a mass of connective tissue.

CASE 7.—In the second case, that of an old woman referred to me by Dr. J. B. Murphy, there was a large primary carcinoma of the breast without involvement of the skin and with enlargement of the axillary lymph-nodes. The patient had vigorous treatment for six weeks, with the production of only a mild reaction. Two months after the treatment, Dr. Murphy wrote me, "I saw Mrs. ——— on last Friday. The carcinoma of the breast has entirely disappeared, but she is suffering from a gastric disturbance from which I fear she will die." She died soon afterward and post mortem it was found by Dr. W. A. Evans that the tumor had been converted into a small fibrous mass. Microscopically it consisted of fibrous tissue bands with a few islets of epithelium, some of the epithelium being in a fair state of preservation, but most of it in a state of advanced retrogression. In these two cases we had carcinoma tissue beneath skin and fat destroyed without destruction of the normal surrounding tissue.

I could recite many more cases of cancer of the breast in evidence of the destructive effect of Roentgen rays on carcinoma tissues situated relatively deeply, but my object now is not so much the presentation of cases as the production of a few definite facts.

A considerable number of cases of sarcoma presenting similar evidence of a selective destruction of sarcoma tissue could be produced, but because the results are so similar I shall give the briefest statement. In general, sarcoma tumors diminish under Roentgen rays more readily than do carcinomas, but because of the more rapid disssemination of sarcomas, radical benefit is less frequent. I have, however, some cases of sarcoma in which most unexpected good results have occurred—results that have lasted a dozen years or more.

CASE 8.—One good result is a case of mixed round and spindle-cell sarcoma in Scarpa's triangle in a woman operated on by Dr. William J. Mayo in April, 1905, and referred to me by him a few weeks later with a very unfavorable prognosis. There was a reappearance of the tumor, which disappeared under Roentgen rays. She was well in August, 1911 —six years later—and I believe is well now.

CASE 9.—Another is a man operated on by Dr. Alexander Hugh Ferguson in 1907 for osteosarcoma behind the clavicle, and referred to me February, 1908, with a mass behind the site of the clavicle, which had been removed, and in the supraclavicular space. This man remains well with no evidence of sarcoma at present—five years after he was regarded as hopeless. He is a vigorous man, active in an exacting occupation.

These cases are of course selected ones; I have seen many cases that have failed, as fail many cases must with a disease like cancer; but these selected cases are only a few of a great many such cases that I might select to show equally striking results. So many cases like these can be produced that they cannot be explained away on the theory of the occasional spontaneous subsidence or disappearance of cancer.

I cannot here present any extensive data on the prophylactic value of Roentgen rays after operation; but I would like to recount briefly one case of cancer of the breast:

CASE 10.—Mrs. ———, aged 45, a physician, came to me in May, 1902, in fear of a recurrence in the chest wall after carcinoma of the breast. Her family history was as follows:

Paternal History: Grandfather, carcinoma of stomach; grandaunt, carcinoma of breast; granduncle, carcinoma of stomach; uncle, carcinoma of intestine; uncle, carcinoma of intestine; brother, carcinoma of intestine; cousin, supposed carcinoma of intestine; cousin, carcinoma of intestine.

Maternal History: Aunt, carcinoma of uterus; aunt, carcinoma of breast, removed, no recurrence; cousin, carcinoma of breast, removed, subsequent history not known. In all ten or eleven carcinoma cases of which she knows in her family in three generations.

The patient's own history was as follows: Left breast amputated for carcinoma, December, 1899; muscles removed from left side, January, 1900; right breast removed, April, 1900; nodule removed below left clavicle, August, 1901; nodule removed above clavicle, February, 1902; nodule removed in neck, March, 1902; nodule removed in neck, April, 1902. Two of the operations were done by Dr. W. W. Keen of Philadelphia, and some others by his associates.

The patient came to me in May, 1902, for Roentgen-ray exposures. She had seven series of exposures between May, 1902, and November, 1905, in all 127 treatments. She has gone now eleven years without further recurrence. It may be pointed out that she had swelling of the supraclavicular lymph-nodes eleven years ago, and such cases are practically invariably fatal. Of course, she might not have had any further recurrence without Roentgen rays, but I venture to believe it would be hard to convince her, with her experience, of that fact.

What is the practical bearing of such facts? And in view of them, what use should be made of Roentgen rays in cancer? In the first place, I would point out that the selective destruction of cancer tissue by Roentgen rays (and radium) is a unique thing. It is something that has never been done before and that no one can now do in any other way. And such cases as I have referred to above show that some practical effect can be produced in cancer after all has been done that is possible by mechanical or other methods of gross destruction. Many cases cannot be helped, but some can be saved. And until a specific remedy for cancer is found, of which there seems little promise now, patients are entitled to the unquestionable prospects of benefit that Roentgen rays offer in many cases. From such a point of view I have used Roentgen rays in cancer for many years and I am sure that the agent has saved a good many patients from an impending death; it has added in the aggregate many years of life in comfort to patients whom it has not cured, and it has saved much suffering to many others whose lives it has not prolonged. On the other side it has often failed; but I believe it has not added to the misery or made worse the lot of any patient. An agent of which these things can be said in so wretched and intractable a disease as cancer is entitled to respect, and is worthy of a better opinion than the skepticism with which it is now considered by many minds.

For example, surgeons as a rule, I believe, fail to appreciate the value of Roentgen rays as an adjuvant to surgery in the treatment of cancer cases. Roentgen rays are useless in many cases of cancer; therefore the method is condemned as useless in all cases, and operation or nothing insisted on always, just as though operation were not useless or worse than useless in many cases also. The Cancer Campaign Committee of Surgeons of North America in its public statement on cancer says, "Cancers can be successfully treated by the knife. . . . there is no chance of recovery except in surgery." This last sentence is not true. The first sentence also is true for the most part only of cancers situated superficially in the body, and many cases of that sort have been cured for a hundred years by other destructive measures than surgery. Surgery is the method of preference for most cancers, and it is well for surgical organizations to teach the public that fact. But if there is anything that surgery should be humble about and alert for help in, it is cancer.

SUMMARY

The effects of Roentgen rays on cancer tissues and clinical experience indicate the use of the agent in cutaneous epitheliomas, and in localized inoperable cancers near the body surface; and further, I believe that the same facts constitute a logical demand that Roentgen rays be used as a measure of prophylaxis after operations on localized cancers near the surface of the body. I specify localized cancers near the surface, because experience has shown that in cases in which the disease has become widely disseminated, and in cancers in the deep cavities of the body, Roentgen rays are practically without avail.

7 West Madison Street.

ROENTGENOTHERAPY IN MEASURED MASSIVE DOSES *

SIDNEY LANGE, M.D.
CINCINNATI

When I accepted the invitation to take part in the program of this section I planned to report some results of roentgenotherapy in massive doses in certain types of malignant conditions which had heretofore not only been refractory to roentgenotherapy, but also, because of their location and anatomic relation, had been regarded as unfavorable from the surgical point of view. I am unfortunately not able to make this report for two reasons: first, because the most of the cases under observation have not been under treatment long enough to warrant drawing conclusions, and secondly, because I am not sure that I have overcome certain obstacles in the technic of the administration of efficient irradiation of these cases. I shall therefore limit myself to some remarks on the measured massive dose.

By efficient irradiation is meant the administration of a dose which will accomplish the desired result; of course, the desired result must be a possible and practical one. In other words, the pathology of the condition selected for roentgenotherapy must be well considered. We must know by experimental deductions or clinical experience that the Roentgen ray will influence the lesion in the desired way. For instance, it is a commonly accepted fact that the Roentgen ray will cause degeneration and destruction of certain cells which we call cancer cells. Any one can demonstrate this by experimentation. But most important is the fact that the Roentgen rays will destroy cancer cells without injuring normal tissue cells which have been subjected to the same dose of Roentgen rays. Because the Roentgen ray does this, it is said to have a "selective" action on cancer cells. What is really meant by the term "selective action" is that the cancer cells are more susceptible to the Roentgen ray, either because they have a higher coefficient of absorption for Roentgen rays than normal tissue cells, or because owing to their subatomic make-up or abnormal metabolic activity, they are less resistant to the influence of the Roentgen ray.

Early in the Roentgen era Guido Holzknecht made the simple yet classic statement that every living cell which has absorbed Roentgen rays will suffer a chemical change which may produce no appreciable effect, or may result in stimulation, irritation or degeneration. The effect of Roentgen-ray exposure on any cell will depend on two factors: (1) the amount of rays absorbed by the cell as determined by certain conditions which are imperfectly understood, chief of which is perhaps the ultrachemical structure of the cell, or in gross terms, the morphology of the cell, and (2) the susceptibility of the cell to the Roentgen ray, the so-called radiosensitiveness of the cell. Among the factors determining the sensitiveness of the cell to the Roentgen ray are the function of the cell, its physiologic relation to the rest of the organism, and its metabolic activity.

The problem for the roentgenotherapeutist then, resolves itself into the fulfilling of three requirements:

1. Certain cells or tissues must be supplied with the kind of rays or quality of rays which they can absorb, for cells are influenced only by absorbed rays.
2. The rays supplied to these cells or tissues must not injure the surrounding overlying or underlying normal tissues.
3. The rays must be supplied in sufficient number or quantity to bring about the desired changes.

In the present state of our knowledge of roentgenotherapy we are not certain that any of these conditions can be fulfilled absolutely. Yet we are fairly well acquainted with the differences in the biologic action of hard and soft rays, and our technic has advanced to the point of enabling us to produce at will rays which are for the most part hard and penetrating, or for the most part soft and non-penetrating.

In the fulfilment of the second requirement, we are aided largely by the fact that as a rule tissues which are normal morphologically and physiologically are much more resistant to the influence of the Roentgen ray than are tissues which are abnormal or pathologic, from either the morphologic or the physiologic aspect.

The third requirement, namely, that of supplying the sufficient, yet not excessive quantity, is the one that concerns us chiefly at this moment. The introduction of the measured dose promises to fulfill this requirement and is one of the most important forward steps in the history of roentgenotherapy. Roentgen-ray dosage is thus relieved in a measure at least from the stigma of inaccuracy and empiricism, and is placed on a rational biologic basis. Analogous to drug therapy in order to elicit the fullest physiologic effect, the full physiologic dose must be administered. To give small doses of Roentgen rays when the maximum effect is desired is analogous to giving 5 grains of potassium iodid at a dose when it is desired to elicit the full therapeutic action of the drug. The full therapeutic action of the Roentgen ray is elicited in the tissue only when by the complete saturation of the tissues the fullest reaction is excited which is compatible with the integrity of the overlying or surrounding normal tissues. Roentgen-ray dosage which falls short of this amount can elicit the full effect only when by frequent repetition of the dose

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* Read in the Section on Pharmacology and Therapeutics of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

the so-called cumulative action in the tissues becomes manifest. To await the development of accumulative effects following repeated small doses is not only uncertain, since the saturation point may never be reached, but it also invites chronic changes in surrounding normal tissues. It is furthermore wasteful of time and energy. In giving Roentgen-ray treatments we are delivering physical energy to the tissues, and the required amount must be delivered in sufficient mass to excite a reaction and thus overcome the inertia of the tissues. We may cite a homely mechanical analogy in the energy required to drive a spike into a board. Repeated small blows from a tack-hammer will never accomplish the results of a single blow with a sledgehammer, although the total amount of energy delivered may be the same in each instance.

I need not refer to the early days of the Roentgen era when by the fractional dose method, small and often inefficient doses were given which extended the treatment over many months. While in many cases and at the hands of certain men brilliant results were obtained, yet not infrequently the results were incomplete or failures. The small doses often stimulate the lesions instead of checking them; again, the lesions acquired a resistance or tolerance for the Roentgen ray which negatived the results. Furthermore, the long-continued exposures invited late secondary changes such as atrophy, etc., in the surrounding tissues with the possibility of later and more dangerous sequelae.

A comparison of past results obtained by the fractional dose method with more recent results obtained by the single massive dose method has renewed enthusiasm in roentgenotherapy. By way of comparison I recall treating a large basal-celled cancer on the cheek of an old woman for a period of six months before effecting a cure, and more recently of treating a lesion almost identical in location and character by the single massive dose method and effecting a cure in five weeks without repeating the treatment. Another instance, fresh in mind, is that of a doctor who was referred for treatment with an epithelioma of the lower lip of eighteen months' standing, involving more than half of the mucocutaneous margin, and more than ¼ inch deep. Submental lymph-nodes were not palpably involved. In the opinion of several surgeons it was an operative case, but a brief trial with the Roentgen ray was suggested. One massive dose was given and at the end of four weeks most of the infiltration was gone and the epithelium had completely covered the area. The patient remains free from recurrence to date, but presents himself for observation once a month, at which times light prophylactic doses have been given.

I need not multiply the evidence to support the efficacy of the single massive dose. Interesting to note in this connection is the fact that not infrequently the epithelium will completely close over an ulcerated skin cancer following a single massive dose before all of the underlying infiltration has disappeared, but without further treatment the remaining infiltration will entirely disappear. In some instances it has been necessary to repeat the dose, either because there was underdosing through faulty technic at the first treatment, or underdosing at one angle or margin of the lesion. The prickle-cell type is of course more resistant than the basal-cell type, and may require repetitions of the treatment. In the fungous types of skin-cancer in which the lesion is of considerable thickness, several doses may be required, which is in harmony with our knowledge of the physical principles of roentgenotherapy. The physical dose (or crude dose) is the amount of rays absorbed by any tissue divided by the number of layers of cells or thickness of the tissue. Hence, in treating a thick or fungous lesion the lower layers of cells will be underdosed, owing to the loss of intensity due to absorption. It is possible that a preliminary curettement may facilitate the administration of the efficient dose to the lower layer of cells in one exposure and thus shorten the treatment.

The massive measured dose, while finding its most brilliant application in the treatment of skin-cancer, should by no means be confined to the treatment of superficial malignancy, but should be extended and applied to every field of roentgenotherapy. Chronic eczema, psoriasis and other chronic skin lesions are better treated by the measured massive dose than by fractional doses, although the dose administered need not always be the full erythema dose.

I have been applying this method to various forms of deep therapy with surprising results. An aluminum filter varying in thickness from 1 to 3 mm. is used, and the pastil is of course placed under the filter. This method has increased the efficiency of postoperative prophylactic treatment of malignancy and has hastened the improvement in recurrences.

Two neglected cases of cancer of the chin are under treatment. Both started from a cancer of the lip, and when the patients presented themselves for treatment, each had a large tumor involving lip, chin and neck, the tumor mass weighing perhaps half a pound and protruding several inches beyond the line of the chin. Under massive doses of Roentgen rays, both cases have improved remarkably. In one case practically all of the infiltration has disappeared and the parts have assumed normal proportions, except for a partial destruction of the lip.

In the roentgenotherapy of uterine myomas, climacteric hemorrhages, etc., the massive dose technic has been found superior to the fractional doses as shown by the statistics of Gauss in the Freiberg clinic. By means of the aluminum filter 3 mm. thick and a compression band to exsanguinate and thus desensitize the skin, it has been possible by Gauss, Schmidt and others to give as much as four times the erythema dose at one exposure and in one series extending over several days to subject the same area of the skin to from six to ten times the erythema dose without apparent injury. By varying the areas of skin exposed it is thus possible to deliver tremendous quantities of Roentgen rays to the deeper tissues. Gauss reports applications to the ovaries of more than one-hundred times the erythema dose in one series of treatments.

Cases of enlarged thymus in children have been cured in one or two massive treatments. This method seems to promise something in the treatment of certain forms of malignancy which are unfavorable for surgical intervention and which are likewise regarded as not amenable to roentgenotherapy. I refer to certain types of cancer about the gums, jaws and tongue. If treated surgically these cases demand heroic measures, producing great deformity and leaving a doubtful prognosis. In this class are especially included those cases of malignancy occurring at the angle of the jaws involving the gums and alveolar process of both upper and lower jaw, or malignancy of the tongue or jaws which extends beyond the midline, and which if treated surgically would mean a great *sacrifice of tissue*, with great deformity and a doubtful prognosis. As recorded results of massive roentgenotherapy in this class of cases is rather meager, I have undertaken to test out the method in a series of such cases which have been considered by surgeons to be unfavorable risks. The inaccessibility of many of the lesions has been the chief difficulty since the efficient massive dose must be delivered to each cancer cell. Special devices such as lead tubes to direct the rays to the proper areas, mouth gags and clamps to evert the lips, etc., are being used. In some cases a preliminary surgical operation such as splitting the cheek to expose the lesion seems necessary. One very favorable result has been achieved so far. The case was that of a cancer of the tongue involving the anterior part of the tongue and extending beyond the midline; a small submaxillary lymph-node was palpable. Under vigorous roentgenotherapy of the tongue and neck the infiltration of the tongue has disappeared and the lymph-node is no longer palpable. A symptomatic cure has been obtained and after a lapse of almost a year no recurrence is evident.

It would seem that the ability to administer the measured massive dose is a sine qua non of successful roentgenotherapy. As the technic is mastered the field of roentgenotherapy seems destined to broaden, which is shown by the successful treatment of certain gynecologic conditions by this method as practiced in many German clinics.

After the technic of measuring the dose in certain units has been mastered, the problem of how many units to give is still uncertain, and to a large extent dependent on individual judgment. In determining the amount required for the treatment of any condition, it must be remembered that the biologic or active dose is the physical (or crude) dose multiplied by the coefficient of susceptibility of the tissues under treatment.

In applying these heavy doses we must not be unmindful of the possible dangers, and possible late effects from the repetition of such doses. Iselin has recently shown that by the use of a filter the erythema dose may be frequently repeated without danger of late results, the danger limits varying in the different regions of the body. It is apparent, however, that such a method as this must remain in the hands of those specially trained and skilled in roentgenology.

5 Garfield Place.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. LANGE, PUSEY AND PFAHLER

Dr. L. T. LeWald, New York: I wish to confirm the statement of Dr. Pfahler in regard to the deposit of lime salt after treatment. The case I refer to was treated thoroughly with radium. It was under observation for about four months. It was an osteosarcoma of the head of the humerus of which a section was removed and pronounced sarcoma by Dr. Wood; Dr. Abbe made an incision and introduced radium. In about a month there was an increase in the lime salts. This increase has continued three months and the case is still under observation.

Dr. G. Betton Massey, Philadelphia: I wish to corroborate what Dr. Pusey said about the penetrating value of the Roentgen ray in some carcinomas by mentioning very briefly at least two cases of secondary growths in the neck above the clavicle—secondary to carcinoma of the breast—that have apparently disappeared under the roentgenotherapy. It is well known that absolutely no other method could have effected such results in these two cases. The terrible misuse of the Roentgen ray, aside from the mortality of some of the operators, shows a need of greater cooperation among members of the profession in order that the best may be done in a given case, whether it be some form of surgery or of Roentgen-ray treatment. Our friends, the surgeons, should get over that intolerant attitude that assumes that some one procedure is of divine origin and must be used simply because it is conventional. I object also to the limitation of the expression "surgery" to that form of hand action which uses the sharp knife. The meaning of the word is simply the doing of something with one's hands. Anything that is employed by the hand in hand work for the local destruction of disease or the treatment of the patient is surgery, even if it is not cutting with steel, and if it produces a better result than some other kind of surgery in a given instance it is good surgery. We want to select the best way to deal with these cases and to remember with open-mindedness that different agencies are required for different phases of the disease even in the same patient.

Dr. Kennon Dunham, Cincinnati: As Dr. Pusey has said, roentgenotherapy is falling into disuse through being handled by untrained men and with improper technic. Papers of this kind which deal with technic and refer to results obtained and substantiate these results by photographic proofs before and after treatment tell the tale better than any amount of writing. Men who have been getting results have been paying much attention to the technic of this work.

Dr. J. M. King, Nashville, Tenn.: The doubt as to the efficiency of the Roentgen ray in the treatment of carcinoma should be wiped out in a body of experienced physicians. Since 1904 I have used the Roentgen ray and my results will parallel those of Dr. Pusey. At first I used small doses, but I have from my own experience increased the mass of the dose, giving only six or eight exposures, or maybe less, in the average-sized epithelioma. I should like to ask Dr. Pfahler to give his technic in treating sarcoma of the bone.

Dr. A. M. Cole, Indianapolis: The massive-dose method has many points of merit, but I have been deterred from using it because of my very strong belief that we do have patients who show an undue susceptibility to the effects of the ray. I know that there are some workers in this field who have come to believe that this is not true; but in my experience I occasionally find a patient in whom a half or third of an erythema dose will bring about a marked dermatitis. For instance, in the last month I have treated a young lady for a lesion on her hand, and after two treatments with the fractional dose method, which I use, she developed a very painful dermatitis. The average patient could have taken eight or ten such treatments before showing the slightest erythema. It does not make any difference if we get a marked dermatitis in treating cases of deep carcinoma or epithelioma, but in skin diseases such as acne, eczema, etc., the massive-dose method, followed, in a susceptible patient, by a severe dermatitis particularly about the face, might be a very serious matter. This objection will always, in my mind, limit the use of the massive-dose method, given at one sitting, to cases of carcinoma and for depilation.

Dr. W. A. Pusey, Chicago: I sympathize thoroughly with the scientific ideals which attempt to determine the limits of physiologic safety of Roentgen-ray exposures, but up to the present time I have been constrained to hesitate about adopting the maximum-dose method in my practice. I have done this for three reasons. First, I am sure that I have had my best therapeutic results by a technic which consists of fractional doses, not of a few heavy applications. Certainly in my experience the attempt at a radical quick dose has not proved as therapeutically efficient as several cumulative doses. In the second place, I cannot get away from the feeling that we are running a considerable amount of danger in the use of massive doses. We can make all of our factors the same except one, and that is the factor of the individual, the personal equation of the patient. At any rate, I do not feel that one patient will react just as the next one will. If I can draw any conclusion from my experience it is that there is a difference of susceptibility in patients. In the third place, to give a massive dose requires attention to a group of important factors, and I think that in routine work the danger of some error is not to be overlooked. As a matter of fact I have been consulted to-day about a burn following a massive dose of Roentgen rays for destroying ringworm, so that the idea of danger is not purely a theory. As for my technic I give repeated doses of Roentgen rays until I produce my effect.

Dr. G. E. Pfahler, Philadelphia: I agree with Dr. Lange that the massive dose is the ideal dose and the nearer we approach it the nearer we approach the ideal, but it is also a more difficult thing to give, requires much greater skill and involves a much greater risk, so that if we want to be on the safe side we had better stick to the small doses. I myself work toward the massive dose, but I do not attempt to give the complete treatment in one dose. I do not treat epithelioma, as I did originally, however, with twenty-five or thirty applications, but give from three to six; in other words, I approach the massive dose as nearly as I can with safety. I believe that there is a certain amount of individual susceptibility, but I believe a great deal of the supposed susceptiblity is due to the variation of the tube used.

Dr. Sidney Lange, Cincinnati: I appreciate that our units of measurement are yet imperfect and subject to variations, and that brings in the factor of the manufacturer, just as it is brought in by the variation in pastils or bromid paper or whatever meter we may use to measure the dose. I still believe, however, that, if the technic is mastered, the results are very much better with massive than with the fractional doses. I looked idiosyncrasy up some time ago and read all the literature I could possibly find on the subject, and in the report of the committees the consensus of opinion was that what we consider to be idiosyncrasies on the part of the patient are variations in technic, that a Roentgen-ray tube is a very much more unstable thing than the patient and that, while we may think we are repeating our technic from day to day, there are certain variations in the filter or the tube used, and in the susceptibility of the part of the body treated. When I produced burns the trouble was not due to idiosyncrasy on the part of the patient, but was due to the variation of the technic, and although I thought that I was repeating my technic I was not. Formerly I was gaging indirect methods instead of using a direct method of measurement. I feel sure that I have accomplished results with massive doses that I have never been able to accomplish before. If you give repeated small doses in alopecia you run the chance of atrophy. It is like wanting to dissolve a gumma with potassium iodid and giving 5 or 10 grains a day, whereas to accomplish this result it might require 100 grains a day. You must also use massive doses of the Roentgen ray to treat ringworm adequately. I can only point to the results obtained by those who are treating large numbers of children with massive doses and getting good results. The German gynecologists could never have accomplished what they are accomplishing now in the treatment of uterine myomas if they were not bold enough to use the massive dose. Five or even two years ago the exposure of a patient to 1,000 units of the Roentgen ray would have been considered criminal, yet, with proper precautions, desensitizing the skin by such massive doses, it has been possible, for instance, to cause the atrophy of the ovary in several sittings, as in Krause's clinic in Freiburg. In the treatment of myomas the percentage of cures with massive doses is much higher than with fractional ones.

Dr. George E. Pfahler, Philadelphia: Someone asked me to describe more fully my technic. The technic is described in the body of the paper in more detail. I should like to emphasize one point in deep therapy of all kinds, particularly of sarcoma of the bone: probably the most important single factor to be watched is keeping the tube hard. The operator is apt to let the tube run down after it has been used a minute or two, in which case skin effects instead of bone effects are produced; the very soft rays instead of the hard rays are utilized.

Dr. Kennon Dunham, Cincinnati: Do you find it necessary to change the tube during a Roentgen-ray treatment?

Dr. G. E. Pfahler, Philadelphia: Whether I change the tube or not depends on the existing instrument. If I use an instrument generating 1 milliampere of current I can use the same tube during the whole treatment. On the other hand, I have used as many as a dozen tubes in a single treatment with the bigger machines. There are a great many points in the technic that have to be adapted to the individual apparatus. I therefore try to stick to principles rather than to give specific details, which will vary with the operator.

THE MINIMIZING OF INSANITY *

MARY LAWSON NEFF, M.D.
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When we consider that the number of students in all the colleges and universities of the nation is exceeded by the number of patients in our hospitals for the insane; that the annual economic loss is conservatively estimated at $100,000,000, to which may be added one-third as much for actual maintenance; while the burden of sorrow and loss in social and ethical ways cannot be computed, we realize that in seeking to minimize this sad feature of our national life we are considering no small problem in medicine, in sociology, in economics and in philanthropy.

Obviously, the first consideration is, how far is it possible, with our present knowledge of preventive medicine, to decrease this number.

At least from 15 per cent. to 20 per cent. of commitments are attributed to alcohol, and from 10 per cent. to 12 per cent. to syphilis. Such cases are, in theory at least, preventable; and we can fairly hope for a marked decrease in these groups as a result of education. If, however, we consider alcoholism itself as a symptom of the neuropathic make-up, and give some weight to the suggestion that paresis develops only in the subject of syphilitic infection in whom the nervous system forms the line of least resistance, we will be inclined to draw conclusions with some degree of caution.

A small group of cases following acute infections, or due to various forms of chemical poisoning, may be added to those having a known and preventable cause.

The number of patients doomed to unavoidable insanity by heredity is difficult to estimate. Massachusetts gives 21 per cent. of admissions as having "markedly poor heredity." The psychopathic hospital of the University of Michigan reports a hereditary factor in 60 per cent. of admissions.[1] Here we have a problem for eugenics.

And to the statesman we refer the problem of immigration. For the national unwisdom of importing as ancestors of our future citizens aliens who furnish a percentage of insanity twice that furnished by our own people, there is no adjective available.

In the preventable cases of insanity, however, the patients, for the most part, either recover, or live a comparatively short time after commitment; so that, while they constitute perhaps one-third the number of commitments, they contribute only a small part of our permanent institutional population. Hospitals for the insane are filled with the accumulating cases of dementia praecox, of the manic-depressive insanities, and of the large group of unclassified psychoses. The underlying somatic causes which produce mental symptoms in these groups we do not know, and it is idle to talk of prevention, in a strictly medical sense.

Here is a great field for medical study, and the work already done is absurdly inadequate. In bio-chemistry, with its problems of metabolism, of auto-intoxication, of anaphylaxis, the field has hardly been touched; and little more can be said of the bacteriology of insanity. Even empirical methods of treatment have not been fairly tried. Who can say what would be accomplished by treating insane patients thoroughly and persistently with open-air life, measured amounts of water, purin-free diet, maximum elimination, and interesting occupations suited to their mental conditions—and combining all these forms of treatment in one question?

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* Read in the Section on Preventive Medicine and Public Health of the American Medical Association, at the Sixty-Fourth Annual Session held at Minneapolis, June, 1913.

[1] Report for biennial period ending June 30, 1911.

When we reflect that every form of insanity with a known cause, is due either to a bacterial or a chemical toxemia, is it not fair to assume that we must look to general medicine for further light on our problem, and to question the psychiatry which is not an integral part of general medicine—especially that which has for its postulate *"Mens insana in sano corpore."*

Bossi[2] has criticized the larger German institutions for the insane because no specialist for internal medicine is included in the staff, and in this respect at least we would do well not to model our American institutions after them.

From the work of the various social agencies we may expect some valuable help in caring for paroled patients, in assisting borderline cases to maintain themselves outside of institutions, and in rendering permanent some recoveries in patients, who, without after-care would not find a safe environment. The "consulting psychologist" may also in time come to be a factor in enabling people of neuropathic inheritance to avoid the dangers of stress.

From the advent of the psychopathic hospital we hope much: yet we cannot ignore the possibility that its various functions as an observation ward, a medical research laboratory, a psychologic experiment station, an institution for the clinical teaching of medical students and a receiving and distributing depot for large numbers of patients, may overshadow its function as a hospital in which real therapeutic work shall take precedence of everything else. The publicity and confusion incident to some of these functions, indeed, make the best kind of therapeutic work difficult. It is interesting to know, in this connection, that the Psychopathic hospital at Syracuse, N. Y., reports that the number of commitments from that county remains stationary, while the population increases. This is not true of the surrounding counties in the same hospital district. It is also interesting to note that 40 per cent. of the patients admitted to this hospital, do not need to be committed to state hospitals. At Ann Arbor the percentage committed is even smaller.

MINIMIZING THE DEGREE OF INSANITY

But there is quite another sense in which insanity can be minimized. We have been considering our problem quantitatively. Let us also consider it qualitatively, and ask the questions, "How far can the degree of insanity be minimized? How much of the mental deterioration to which we have become accustomed could have been prevented?"

As institutions have multiplied and increased in size, they have been compelled to depart farther and farther from the "protected homes" that apparently formed the earlier ideal of care. That inhuman thing that is connoted by the term "institutionalism" has brought about conditions under which none of us could remain normal.

From the following incident my own vital and personal interest in an effort to normalize the life of the insane dated. Passing through a ward where flowers, sunlight, air and pleasant furnishings gave a superficial appearance of comfort, my attention was called to the patients. These were sitting on either side of the corridor in straight rows, interrupted here and there by a potted plant, or by a "sacred" sofa pillow on which human head had never lain. This row, the chairs all alike, and the faces all turned the same way, left nothing to be desired from the standpoint of geometry. With hands folded, often with eyes closed, not one of these people showed any gleam of interest in life. I stopped to speak to a sweet little white-haired woman, saying, "Why don't you people find something to do? Can't you play games, or read aloud, or something? You can at least break up this row, and turn around and talk to each other!" The reply, given in a perfectly colorless voice, was, *"We are not allowed to turn around. The matron thinks we look neater sitting this way."* Then and there I determined to study my problem from the patient's point of view; and as I studied it thus, there grew a deep conviction that the cruelest thing that comes to these thousands of fellow-beings whose lives are spent shut away from the world, is ennui—the unspeakable ennui of hours and days and months and years, colorless beyond anything we can imagine.

Normal life is largely a series of responses to the three stimuli furnished by necessity, ambition, and the family affections. Kant expressed this when he said: "A man to be happy must have something to work for, something to hope for, and something to love." The institutional patient has no necessity—there is no need for him to earn his daily bread. He has nothing to gain that stimulates hope, no opportunity to improve his condition, or one so trifling that it cannot be called an incentive. He has no loved ones to care for and serve. He is suddenly and effectively cut off from the motives that actually make life, and in this abnormal environment, already abnormal himself, we may expect, and we certainly find, that after a time we have a mental condition that is a blend of the original psychosis and the "psychosis of abnormal living." The patient becomes a sort of human palimpsest, and only the mental archeologist could say how much of that which can be deciphered is of the original writing.

THE REACTIONS TO ENNUI

There are four main reactions to prolonged ennui—reactions that are not an essential part of the insanities, but such as would occur with ourselves if similarly placed. The most common one is apathy—a gradual subsidence into a dull vegetative existence, an "acceptance of cold-storage life," as a superintendent once expressed it, giving to pathos the whimsical garb in which we often clothe it. A second reaction is violence. The patient to whom apathy is temperamentally impossible, finds some outlet for his energy, and some relief from being bored, in breaking a window, or screaming, or giving an attendant a black eye. The "disturbed" patient is more frequently the result of our methods of care than the occasion for them. A third reaction is untidiness. The unoccupied mind centers itself on physical sensations, and picking at the skin, spitting, pulling out hair, and all the familiar habits of the "untidy" ward become fixed. The fourth reaction is the elaboration of delusions, fears and obsessions, until the normal possibilities of the patient are lost in perverted mental activities that obliterate everything else.

The great majority of patients in hospitals for the insane who have not been kept busy and contented will fall into one of these four classes. The problem, then, is to find normal stimuli, incentives, rewards, and human reactions for people whose horizon is contracted, and whose mental life is less normal than our own—though no such gulf exists between the sane and the insane as is usually assumed. Only by treating the insane just as we ourselves would wish to be treated, will practical and effective ways of helping them be found. The "normal areas" of the patient's mental life are the ones on which to base his treatment, rather than the abnormal ones.

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[2] Wien. klin. Wchnschr., Nov. 21, 1912.

Since we cannot avail ourselves of the major stimuli of life, we must utilize to the fullest possible extent the minor ones. All forms of self-expression should be developed in an institution, using the play-motive as largely as possible. Play has been truthfully called the greatest educational agency that exists. In normal life years of play precede and prepare the way for work. By the same path the patient with the mental status of a child may best be led to more serious forms of employment. Every method of stimulating ingenuity, inventive ability, aesthetic work, or self-expression of any kind, should be employed. Love of approbation is a fundamental emotion, which is not lost even in marked dementia, and this can always be utilized. Altruism can be developed to a degree surprising to any one who has not actually attempted the work.

I once saw a group of discontented patients transformed by "adopting" an orphan asylum for whom hundreds of little garments were made. In another hospital a society of patients calling themselves "The Helping Hand" spends certain afternoons working for the less fortunate wards—preparing material for the teacher who reeducates deteriorated patients; making hoods and slippers for the tuberculous ward; mittens for the men who shovel snow—acting, in short, like ordinary human beings. Recently a group of patients packed a box for Dr. Grenfell's work in Labrador, taking great pleasure in filling it with articles made by their own hands.

The activities furnished for patients should be as normal as possible in every way, including carefully adapted methods of teaching, a variety of work, liberal provision for recreation, respect for the "personal equation," reward for the work performed, and a "therapeutic disposition of the product." After a patient has done his or her fair share of the institutional work, some part of each day should belong to the patient. Monotonous and unremunerative toil is not therapy. A patient who has always estimated the value of labor in dollars and cents should be allowed the privilege granted to the convict in the more progressive states, of receiving at least some small share of the money value of his labor. If we say to a patient, "You are a human derelict, supported by the state, and all that you can earn belongs to the state," we can hardly expect as a reaction the interest and pleasure that is the essential part of mental therapy.

THE INDUSTRIAL STATUS OF THE INSANE

In an admirable discussion of the rights of inmates of penal institutions, Lyon[3] questions "the assumption that the delinquent has forfeited his industrial status." The assumption that the unfortunate patient with mental symptoms, who is entitled to sympathy instead of discipline, has "forfeited his industrial status" would hardly seem tenable. Prof. C. R. Henderson of the Department of Economics in the University of Chicago, expresses admirably the proper point of view in this regard by saying, "What should be the patient's occupation, and what should be the disposition of his earnings should be determined by medical authority, with sole reference to its effect on his health." As the wide-spread movement in the field of occupational therapy increases, this question of the wise and proper disposition of the products of the patient's industry becomes an increasingly important one. It has been dwelt on at some length because widely varying views are held, and actual cases of transforming what should be a therapeutic measure of the greatest value into a mere exploiting of a defenseless class of people have not been lacking.

The economic gain in transforming the violent patients into tractable ones, the untidy into neat ones, the destructive into productive ones, and the unhappy into happy ones, which follows a well-planned occupation movement, is very great, even where patients are given, as is done in some institutions, all the proceeds from such work as can be sold. In visiting some sixty institutions for the care of the mentally abnormal I have noted repeated examples of this economic value of proper occupation. This is perhaps not of the first importance to the physician, but it is of the greatest assistance to us in seeking the legislation on which we must depend for future advance. One instance recalled was the transforming of four "disturbed" wards, under the supervision of a skilful and devoted physician, into three quiet, cheerful and industrious halls, with a residue of disturbed patients in the fourth hall only. Thirteen nurses now do the work performed before this transformation by seventeen.

In another hospital the occupation department, under a competent teacher and a wise superintendent, is admirably managed in this way. Each patient is asked to do half a day's work for the institution, without reference to whether his maintenance is paid or not, as his share in the community life. The other half day is his own, and in this time opportunity is given to join one of the occupation classes. If a basket is made or a rug woven that sells for a dollar, half of this goes to support the occupation department, in purchasing materials, paying the teacher's salary, etc.; while the other half is credited to the patient. If, however, he has been unwilling to do his share of work for the community, half his earnings go into a special fund for the working patients who are unable to earn a little spending-money. This plan appeals to the patients' sense of fair play, brings about loyalty to the institution and is, in the best sense of the word, economic.

The beginnings already made in this wide-spread movement to provide a life as nearly normal as possible for the insane, and to prevent for the future gratuitous mental deterioration, are so fruitful and encouraging, that we may hope for much greater results within the next few years. What may ultimately be accomplished, no one can yet say, but we may hope soon for a day when the invisible motto now lettered over the door of our hospitals for mental patients, "From him that hath not shall be taken away even that which he hath," shall fade, and the institution for the insane shall be a protected community of people living as normally as possible.

ABSTRACT OF DISCUSSION

Dr. Pauline M. Townsend-Hanson, Marshalltown, Iowa: As a medical student, I spent a summer in the infirmary of the Pennsylvania Hospital. Never have I forgotten, and so long as I am able to be active never shall I forget, the many impressions carried with me from the infirmary of the insane asylum. No system was planned for employment of the patients and, outside of the head nurse, none of the attendants in charge had any preparation for the work. Any one who was willing to work could go in and be tried out on the floor, and some of the attendants in the asylum were of a very inferior type. The pay was $15 a month with board and laundry, and attendants who could be secured for $15 a month were inferior in capacity, cultivation and mental development.

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[3] Jour. Criminal Law and Criminology, May, 1912.

Even these inexperienced attendants recognized that a desire for employment on the part of the patient was a hopeful sign of recovery. We encouraged employment as much as possible, but a systematic method with a person trained for it would have done much more. Work was given to the patients as an experiment, but no effort was made toward remuneration. Some of these patients would knit yards of lace, if we would supply the thread. I felt, however, that I had no right to take the labor of the patient without recompense. I shall be glad to support any move that will help to bring about, as soon as possible, the desired change in our state asylums suggested by Dr. Neff.

Dr. E. S. Everhard, Dayton, Ohio: It seems proper that we discuss the preventive as well as the minimizing side of this question. The point that I wish to bring out is a little different from that brought out in this paper. Before patients are taken to the insane asylum they are in the hands of the general practitioner. In the last year or two I have asked the physicians in charge of several of our insane hospitals what they were learning as to the causes of insanity, and three times I have received the reply: "We can find out nothing about these patients, because we can not get any history. The patient comes to us, often under the care of an ignorant ember of the family or a neighbor, with a well-developed ise of insanity. Neither the patient nor his attendant is eliable and we can therefore get no history worth considering."

When I asked who was responsible for this, who committed the patients, I received the reply that there was only one physician on the board of commitment and that he did not know the patient, as a rule, and could not get the history. It seems to me that the problem is for the general practitioner, who, sometime during the process of the development of this insanity, has hold of the patient and can get the history. I have asked the men in charge of the hospitals for the insane why they did not start some movement by which they could get the history of these cases, and I received the reply that the general practitioner is not interested. I want to make an appeal for the general practitioner. We are all interested in the things we know about. We do not know how to obtain the general history of the patient in such form that it will be of service to the persons in the hospital who take care of these cases. The experience of the Committee for Public Health Education, which I have been connected with for four years, has been that if you want anything of the general practitioner, and tell him what you want, he is interested. Would it be possible to bring this matter in some way before the general practitioner so that he will know in what way he can best help the hospitals to obtain the history of the patient and to gather those statistics which are necessary in order to make a proper study of the cause and prevention of insanity?

Dr. J. N. Hurty, Indianapolis: I have made a superficial study of insanity in our hospitals for the insane to obtain some information in regard to the prevention of this trouble. I have found that 100 per cent. of the patients were great medicine-takers, and it occurred to me that drugs were probably another source of mental poison. I visited the houses of ten insane persons, all farmers' wives, and all were consumers of patent medicine. Alcohol had entered into their insanity, without a doubt, and I do not know to what degree the drugs contained in these patent medicines had affected their cases. Sleeplessness, which, in many instances, is a sign of approaching insanity, had come on them, and for this hypnotics had been prescribed in many cases, and the condition was probably made absolute by these hypnotics. In the light of the investigations made, I conclude that alcohol accounts for fully 25 per cent. of insanity. The effects of constant medicine-taking are also to be considered. Another 25 per cent. seems to be due to syphilis. If alcohol, drugs and syphilis are causes of insanity, we have within our control three important forces which can be checked.

Dr. M. P. Overholser, Harrisonville, Mo.: I wish to emphasize that part of Dr. Neff's paper in regard to the industrial, educational, occupational and diversional treatment of the chronic insane, for I believe that herein lies a most important and yet undeveloped field of work in the treatment and management of a large percentage of the chronic insane confined in our state hospitals. It is true that occupational and various diversional treatment cannot restore that part of the mind which disease has destroyed, but in a large percentage of cases the scraps of a wrecked and shattered mind may be stimulated and reeducated by the vivifying influences of occupation and diversion. We have tried this and know it to be true. Several years ago the legislature of Missouri granted one of the state hospitals a special appropriation for the construction of an industrial building. This building was fitted up so that we were able to place a large number of the patients at work in the manufacture of mattresses, brooms and brushes of various kinds. The women patients are taught to make numerous articles of wear and ward supplies, such as dresses, bonnets, men's shirts and overalls, carpets, rugs, quilts, etc. In addition to this, we added in March, 1912, another department called the art or occupation department, with a woman instructor, who teaches the women patients raffia weaving, brass craft, cross-stitch, French and punch embroidery, crocheting, drawn and hemstitch work, weaving bobbin lace and Navajo and other rugs, making artificial flowers and a number of other things too numerous to mention, to which can be added from time to time new and novel diversions in the way of occupation. The monotony of the occupational treatment is broken every two weeks by a tea party, at which fifty or sixty of the women patients meet in the occupation room dressed in their best gowns and listen to music, play various games or busy themselves with needlework and partake of refreshments. Every four weeks a large number of the patients, male and female, with nurses, attendants, employees and officers, meet in the chapel to play cards, checkers, dominoes, flinch, jack-straws and other games. The beneficial effects of these methods of treatment on the attitude, disposition and general demeanor of many of these patients are remarkable, and I therefore wish to emphasize the importance and necessity of increasing this kind of work in our state institutions for the insane, for I believe that no more powerful therapeutic agent can be found in the treatment of a large percentage of the insane.

Dr. S. A. Knopf, New York: My work with tuberculosis takes me occasionally into insane asylums and I have had occasion to observe some of their peculiar features. I have not made so thorough a study as Dr. Hurty has of the etiology of the disease of these and other unfortunate sufferers from mental affliction. He says that 100 per cent. of insanity is due to drug-taking. This is a very large percentage; I wonder how he came to this conclusion.

Dr. J. N. Hurty, Indianapolis: I followed out the cases of ten women and they were drug-takers—patent-medicine takers.

Dr. S. A. Knopf, New York: I believe that the humdrum existence of the farmer's wife in far outlying districts and isolated regions is more responsible for insanity among these poor women than drug-taking. I wish to emphasize what Dr. Hurty says concerning syphilis, but I wish to go a little further. We have many forms of insanity which have never been considered as of syphilitic origin until recently; that is to say, until Noguchi of the Rockefeller Institute found in the brains of many persons who had died in the asylums the organisms productive of syphilis. Antisyphilitic treatment has been inaugurated in many cases with good results in which there were no outward syphilitic symptoms. I am convinced that many of our defective children owe their infirmity to a syphilitic transmission; hence, let us not be afraid, when we are in the presence of the mentally defective child, to apply the Noguchi or Wassermann tests. You will be surprised at the number of times you will find evidence of a syphilitic transmission. As a measure to diminish insanity among the workers, let us appeal to the employers, the great industrial proprietors, the great philanthropists, to inaugurate a welfare movement among their employees, increasing the hours of rest and recreation. The man or woman constantly doing the same thing for twelve or fourteen hours, six days in the week, and sometimes for six and a half days, is apt to become mentally depressed and even insane. It is this humdrum existence of so many of our industrial employees which leads directly to the insane asylum, or indirectly through alcoholism. Let philanthropists inaugurate also some sort of pleasant diversion among farmers, the toilers of the soil in isolated regions, and insanity among them will diminish. Insanity is as much a social problem as a medical one, and if the social conditions of those liable to become insane are improved their number in the asylums will surely diminish.

Dr. A. W. Erskine, Cedar Rapids, Iowa: Six years ago it was my privilege to be associated with Dr. Neff in the institution where she first started her work in the normalization of the life of the insane, and I am familiar, therefore, with some of the difficulties of her work and some of the discouragements met. The occupation classes were known from one end of the hospital to the other by nurses, attendants, and, I am sorry to say, a large percentage of the staff, as "booby classes," and ridicule was heaped on them. I appreciate the courage that has permitted this work to be carried on in spite of the ridicule, unjust criticism and opposition that it has had to contend with. I believe that it is due to a few pioneers in this line of work that the care, education and treatment of the insane is gradually being brought out from a chaos of empiricism and put on a rational basis.

Dr. Bertha Van Hoosen, Chicago: I want to give a little bit of ancient history and a tribute to Dr. Palmer of the Michigan Insane Asylum at Kalamazoo. Twenty-three years ago I had the pleasure of being one of the assistant physicians in the Kalamazoo Insane Hospital. Whenever Dr. Palmer went to Chicago to buy clothing and materials for the patients, he made it his business to buy as though for individual cases. No patients were allowed to have dresses, shawls, hats, or any article of clothing alike. On the day that he returned, the patients were invited to go and choose their dresses, as they would go to a store. I never saw a patient put under restraint in that hospital.

The patients were all employed in the most natural sort of way. When they were dements and could be taught hardly anything, they were still able to draw the mops across the floor. That was the most practical and simple sort of exercise and employment. The patients also worked in the kitchen, in the dining-room and in the laundry; there was absolutely no department that was not filled with patients and they had a chance to choose the kind of occupation. Every day they were allowed to go out and take exercise; sometimes two and three times a week we had a fine entertainment. Teachers passed into the large chapel in which Dr. Palmer took so much pride; in fact, just after I left, he built a new chapel, in which the rooms were so arranged that the neurotics could be separated from the other patients and yet attend these entertainments, which they of all classes seemed to enjoy most. More than all that, every assistant physician was trained to make it his business to get into the lives of his patients. I had a certain number assigned to me and all the letters from relatives were turned over to me to answer; these letters were inspected by the superintendent and criticized; we had to find out in this way what the patient's home and surroundings were and what the patient's tastes were; in fact, it would take me a long time to tell the number of ways in which the patient was considered as an individual in the Michigan State Asylum so many years ago.

Dr. Mary Lawson Neff, Fairfield, Iowa: I know that there are hospitals here and there that have always maintained a high grade of humane work. One good point brought out in the discussion is that there are some persons who will remain sane, or stable enough to maintain themselves in society in a certain environment, who will become insane in a different environment. There is a great task for the medical profession in educating these people of neuropathic make-up.

Dr. Everhard spoke of the difficulty of getting a good history. Patients come to an insane asylum often after having been sick for years. They have had headaches, insomnia, mental depression, attacks of rheumatism, gout, neuralgia, eczema, all sorts of symptoms of a gradually increasing toxemia; but the general practitioner who sends them is apt not to take the trouble, or does not consider it important, to send a good history of the patient's physical condition preceding the development of mental symptoms.

This prolonged toxemia would give other indications, especially changes in the kidney. The reports of post-mortem examinations at the State Hospital at Norristown, Pa., were analyzed with the following result: The insanities without assigned cause (below the age of 60) were tabulated for a period of fifteen years. This covered the services of five pathologists. These cases, at necropsy, gave 90 per cent. of chronic interstitial or other form of nephritis. This must mean that we have a tremendous factor of a toxic nature. Many other things point to the same conclusion, and make this early medical history in a case of insanity of great importance.

PRECOCIOUS MENSTRUATION *

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The term "precocious menstruation" should be limited to cases of more or less periodical menstrual discharge occurring in children before its usual appearance at the age of puberty (before the age of 9 or 10 years—Schauta), and should not include cases of hemorrhage from the vagina occurring within a few days after birth and not recurring subsequently.

Precocious menstruation is usually accompanied by signs of precocious maturity, i. e., "the premature development of the whole organism concurrently with menstruation and ovulation" (Morse[1]); or, in other words, "precocious menstruation with an early appearance of the external manifestations of puberty" (Croom[2]). These cases are by far the most interesting, and my case is of that type.

REPORT OF CASE

History.—Baby X., aged at time of examination 2 years (January, 1913). Adopted shortly after birth, at which time a Wassermann proved negative. History of parents unobtainable except that father was a Jew, mother an American. Labor normal. Weight at birth about 6½ pounds.

Bottle-fed, with modified milk. Weight at 1 month, 7 pounds; 2 months, 8¼ pounds; 3 months, 9⅜ pounds. At this time there was a severe gastro-intestinal disturbance with temporary intolerance for cow's milk. A wet-nurse was employed for several weeks, and then a weak milk modification. Weight at 4 months, 10¾ pounds; 5 months, 12 pounds; 6 months, 13⅞ pounds; 7 months, 16⅛ pounds; 8 months, 17½ pounds; 9 months, 21⅜ pounds.

The first tooth erupted at 10 months, at which time the menstrual flow first appeared, lasting three days. The discharge was of bright red blood from the vagina, with slight menstrual odor. At this time the child seemed rather large for its age, but no other signs of precocious maturity were noticed. Menstruation recurred at intervals of from one to three months, most frequently at intervals of six weeks. The child menstruated eight times in fourteen months. For a few days before periods a slight leukorrhea was noticed; the child was rather cross and acted as if in pain. She walked at 17 months after braces had been applied to support the limbs.

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* Read in the Section on Diseases of Children of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

[1] Morse, John Lovett: Precocious Maturity, Arch. Pediat., 1897, xiv, 241.

[2] Croom, J. Halliday: Premature Menstruation, Allbutt's System of Gynecology, 1906.

First Examination.—Large, well-developed, healthy looking child. Skin dark and hair very curly (Jewish type). Mentally bright for her age. Chest and abdominal examination negative as regards internal organs. Weight 38 pounds; height 37 inches; 17 teeth; circumference of head 19 inches; chest below breasts, 21 inches; across breasts, 22½ inches; abdomen at navel, 22 inches; breasts very prominent, about size of half an orange; nipples well developed, with slight areola; a few hairs around nipples; hair quite noticeable in the axillae, and pubic hair very noticeable; mons veneris and labia very prominent; hymen well developed, the opening admitting the tip only of the little finger, preventing a digital examination of pelvic organs. Rectal examination objected to, and photograph not obtainable.

Second Examination.—Age 28½ months. The child had menstruated four times in four and one-half months. Menstrual flow seemed to be increasing both in quantity and duration, and the peculiar menstrual odor was very marked. The child must wear napkins during a period of about a week. Leukorrhea was increased, being present most of the time. Weight 41½ pounds; height 39 inches; 18 teeth; circumference of head, 19 inches; chest below breasts, 21¼ inches; across breasts, 23 inches; abdomen at navel, 22 inches; pelvis, 23 inches. The breasts were noticeably more prominent, as also the growth of hair under the arms and about the external genitalia.

OTHER CASES

Lenz[3] reports in tabulated form 130 cases of precocious menstruation, dating back over 100 years. In addition to the case just reported I have found the following references to cases apparently not included by Lenz.

Raffaelli[4] reports a case, D. E., aged 4½ years, menstruating for several months, lasting about eight days, preceded by abdominal pains. Height, 1 meter, 10 cm., weight, 19 kg., and average build of a 6-year-old girl. No syphilis, alcoholism or other hereditary disease. Hair in axillae, mammary areola very noticeable, but no enlargement of the mammary glands. Mons veneris prominent and covered with hair about 1 cm. long. Labia very much developed, resembling those of a girl 10 or 12 years old. Hymen well developed and the opening therein permitting introduction of tip of little finger. No evidence of pelvic tumors.

In his article Raffaelli refers to the bibliography on the subject in the work on Children's Diseases by Grancher and Comby. He also refers to a number of similar cases, most of which are included in Lenz's tabulation. The apparent exceptions are as follows:

Reim: The case of a girl 6 years old, who menstruated at 5 years; physical signs of puberty of a girl 13 or 14 years old. Abdominal examinations revealed presence of an ovarian cyst.

Woodruff[5] reports a case of a girl 6 years and 2 months old who menstruated at the age of 2 years. She was developed, apparently, like a girl of 12 to 14 years.

Barband and Lefevre[6] report a case of Puech of a girl who menstruated at the age of 4 years. When 8 years old she had sexual intercourse and miscarried at three months.

Dotti[7] at the meeting of the Tuscan Pediatric Society in 1908 presented three cases of 8, 3 and 2 years. These three cases were the only cases noticed out of 6,000 patients during a period of two years at the Pediatric Clinic, Florence, Italy. In one of the three cases the important factor was a suspicion of hereditary syphilis (premature birth, mother advanced in years). In all three the general body development was above the average, with psychic deficiency. One of the girls had a marked development of the thyroid.

In the discussion of Raffaelli's case, Professor Mya cited a case of precocious puberty seen by him in a girl 4 years old, and Dr. Funaro, a case of precocious menstruation that he had seen at the Charité in Berlin, in a girl of 5 years. It is possible that this is the same case seen by me at the orthopedic clinic of Professor Hoffa in 1908, at which time the following notation was made:

> Girl nearly 5 years old has menstruated almost regularly since 7 months old. Precocious physical development first noticed when about 1 year old, and from that time has grown very rapidly. Breast, pelvis, external genitalia and body growth that of a girl 10 or 12 years old. Hair in axillae and pubic hair very noticeable. Intelligence about normal for age. Comes to clinic for left-sided coxitis. Cast applied.

Raffaelli observes that "Many of the cases present pathological conditions such as tumors, abnormal development of the thyroid, suspicion of hereditary syphilis, rickets, obesity, hydrocephalus, adenoids, psychic deficiency, etc." He further observes that "According to some authorities, beside the climate, the altitude, the proximity of the sea, country or city life, the social condition, the color of the hair, the mode of living, education and race would seem to have a certain influence on menstruation; in fact, it is proved that the Jewesses menstruate before many other women (the Slavs for instance) who live in the same climate."

The fact that these cases are a source of embarrassment and worry to the parents, as well as to the children themselves when they become old enough to appreciate their condition, ought to be reason enough to bring up the question whether anything can be done to control the condition. Glynn[8] refers to two remarkable instances of sexual development in children with a tumor of the ovary (Lucas[9]) and of the testicle, respectively, in whom "The former childlike appearance returned after the removal of the tumor." He also refers to seventeen examples of sex abnormalities in children associated with adrenal hypernephroma verified post mortem, the abnormality in most of the cases being of the type of precocious maturity. He further speaks of the relationship of the pituitary gland to the adrenal gland and sex characters; also of the pineal gland and sex characters. Thus he says "tumors in the pineal region, though rare, are occasionally, like those of the adrenal, associated with changes in sex characters, particularly true precocious sexual development.

Congenital hypertrophy of the pituitary gland is frequently associated with giantism and congenital hyposecretion with infantilism (Glenn[10]). There is probably also some relationship between the ovaries and the thyroid gland.

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[3] Lenz, J.: Vorzeitige Menstruation, Geschlechtsriefe und Entwicklung, Arch. f. Gynäk., 1913, xcix, 67.

[4] Raffaelli, G.: Un caso di mestruazione precoce, Estr, dall' Osp. d. Bambini di Milano, 1912, No. 1; Abstr. Brit. Jour. Child. Dis., 1912, ix, 235.

[5] Woodruff, E. G.: Case of Unusually Early Menstruation. Med. Rec., 1896, xlix, 338.

[6] Barband and Lefevre: Essai sur la puberte chez la femme, Paris, 1897; Quoted by Raffaelli (see note 4).

[7] Dotti: Riv. di clin. Pediat., Maggio, 1908; Quoted by Raffaelli (Note 4).

[8] Glynn, E. E.: The Adrenal Cortex, Its Rests and Tumors: Its Relation to Other Ductless Glands, and Especially to Sex, Quart. Jour. Med., 1911-1912, v, 186.

[9] Lucas, C. R.: Tumor of the Right Ovary in a Child Aged 7 Years Associated with Precocious Puberty, Tr. Clinical Soc., London, 1887-1888, xxi, 224.

[10] Glenn, T. H.: Internal Secretions, Denver Med. Times, May, 1913, p. 533.

Since these cases of precocious menstruation and precocious maturity are, undoubtedly abnormal and probably pathological, I would like to leave with you for discussion and for future thought the question whether it is permissible to administer experimentally some remedy, perhaps some glandular substance, to counteract this tendency to precocious development.

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THE USE OF BLOOD-AGAR IN THE ROUTINE EXAMINATION OF MILK SEDIMENTS *

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With the ever-increasing evidence of the relationship between milk and the spread of various infections with members of the streptococcus group, methods for their detection in milk and for distinguishing the different types present have been devised.

The direct examination of the stained sediment, originally employed as a means of discovering inflammation of the udder, has been used in an attempt to separate pathogenic and harmless streptococci. Thus, Lewis[1] differentiates these organisms according to the length of the chain and irregularities in the size of the individual cocci. Ruediger,[2] however, believes that these are unreliable grounds of distinction, while Heinemann,[3] Miller,[4] Hiss and Zinsser[5] and Jordan[6] all state that it is impossible to differentiate with any certainty nocuous from innocuous types. Surely it may be stated that the bacterioscopic method is unsatisfactory for this purpose.

Attempts have also been made to distinguish between varieties of the streptococcus by the agglutination test, but these, too, have been failures, heterologous strains often reacting better than homologous.

Following the discovery of Schottmüller[7] that *Streptococcus pyogenes* grows as small hemolytic colonies on blood-agar, this medium has been used to separate the members of the group. The results seem to have varied somewhat; thus, Müller[8] often found milk streptococci as hemolytic as *Streptococcus pyogenes*. Ruediger,[2] on the other hand, studied thirty-five strains of streptococci obtained from milk and concludes that *S. lacticus* can be distinguished from *S. pyogenes*, as the former grows in the form of green colonies with little or no hemolysis.

My first experience with the use of blood-agar in the examination of milk was in the course of the bacteriologic study of an outbreak of septic sore throat. In this investigation the milk sediments were first examined microscopically for pus and streptococci, and those samples that were considered suspicious were centrifuged in quantities of 50 c.c. each and the sediments inoculated subcutaneously into white mice. On the death of the mice, cultures were made from various organs, blood-agar plates being used except in a few instances. In this way I was able to isolate from twenty-three animals 11 strains of *Diplococcus pneumoniae*, one *S. pyogenes* and one *S. epidemicus*. I obtained these two types of the streptococcus, together with the pneumococcus, from one mouse. These organisms were subjected to a thorough cultural study and were found to correspond in all their essential characteristics to the descriptions given of these bacteria.

The work of Ruediger[2] suggested the possibility of still further safeguarding a milk-supply by the use of blood-agar plate-cultures. Following up this idea, eighty-six such examinations have been made. The work so far has been limited to an investigation of the sediment of pasteurized milk and of one which meets all the requirements of a certified milk.

In all cases 50 c.c. of milk were centrifuged from forty-five to sixty minutes, the sediment was mixed with 1 c.c. of sterile physiologic salt solution, and a platinum loopful of this was then inoculated on a blood-agar plate. With a sterile bent glass rod the fluid was rubbed over the surface of the inoculated plate and another one, and the two Petri dishes were placed in the thermostat. After twenty-four and forty-eight hours' incubation they were examined for the presence of colonies characteristic of the members of the streptococcus-pneumococcus group. If present such colonies were picked and their cultural properties studied.

In this way eight organisms have been isolated from seven samples of milk. Four of these were cultures of *S. lacticus:* the colonies of each of these strains were greenish and three of them showed a very narrow zone of slight hemolysis.

Three were pneumococci, these micro-organisms growing as greenish colonies resembling blistered paint. Two strains were pathogenic for white mice. The eighth was a culture of *S. pyogenes;* the colonies were not green and were surrounded by a distinct zone of hemolysis. This streptococcus was pathogenic for white mice.

This streptococcus was not isolated from pasteurized milk, but from the milk of the other dairy previously mentioned. In this case the source of contamination was discovered to be one cow in the herd, which, though showing no physical evidence of udder inflammation, was nevertheless secreting milk containing large numbers of these streptococci. This cow was immediately eliminated from the herd.

The meager number of examinations made precludes the drawing of any conclusions. The results, however, have been sufficiently satisfactory to warrant a continuation of this work. Thus far only pasteurized milk, with one exception, has been examined, but in the future these examinations will be extended to raw milk which microscopically shows excessive numbers of streptococci.

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* Read in the Section on Preventive Medicine and Public Health of the American Medical Association, at the Sixty-Fourth Annual Session held at Minneapolis, June, 1913.

1. Lewis: Jour. Am. Pub. Health Assn., 1911, i, 778.
2. Ruediger: Am. Jour. Pub. Health, 1912, ii, 107.
3. Heinemann: Jour. Infect. Dis., 1906, iii, 173.
4. Miller: Bull. 56, Hyg. Lab., U. S. P. H. S., p. 491.
5. Hiss and Zinsser: Text-Book of Bacteriology, 1910, p. 688.
6. Jordan: General Bacteriology, ed. 3, 1912, p. 503.
7. Schottmüller: München. med. Wchnschr., 1903, l, 849.
8. Müller: Arch. f. Hyg., 1906, lvi, 90.

The Reporting of Diseases.—Physicians are occasionally heard to express impatience with the requirements of the law in regard to the reporting of communicable diseases to health authorities. It is obvious that such physicians have given little thought to their responsibilities in safeguarding the public health. Health authorities are ready to attack communicable diseases in their incipiency. Scientific knowledge of the more serious of such diseases has led to the adoption of adequate means of controlling them. But health authorities cannot act blindly. They must deal with the individual case and to do this they must know its location and the circumstances connected with it. It is the duty of physicians to furnish this important information. There can be little question as to the moral responsibility of a physician for the secondary cases resulting from an unreported primary case or for the consequent fatalities.—*Bull. Ohio State Board of Health.*

Therapeutics

THE OPIUM AND MORPHIN HABIT

There are so many legitimate and so many illegitimate "cures" for this habit, that a review of the opinions of a man who has had a large experience in the treatment of these conditions is of value. Dr. George E. Pettey[1] of Memphis, Tenn., has recently presented a book which is well worth careful reading and review.

This article embodies Pettey's ideas of the pathology and the treatment of these drug addictions, which are apparently becoming more and more frequent. He says that the average Caucasian will develop an addiction to opium or one of its alkaloids after thirty days' daily use, and but few of these persons will be able to stop the use of the drug after that length of time by their own efforts. If the drug has been used for three months or more, he finds it almost impossible for the person to stop its use without medical aid.

Crude opium and laudanum taken by the mouth are more slowly absorbed than the alkaloids of opium, and the narcotic impression is less; consequently they may be taken longer than the alkaloids without causing an addiction. Pettey finds also that morphin may be used for a longer time without causing the habit when taken by the mouth than when taken hypodermically. Codein and heroin may be taken for a longer time than morphin without causing the habit, he thinks, because they inhibit secretions less and cause less intestinal toxemia, and therefore less self-poisoning. Of course, it is well known that any narcotic drug may cause a habit if taken for a longer or shorter period, but he recognizes, as has been observed by many medical men, that any of the atropin series may cause a habit, whether it be belladonna, atropin, scopolamin or any other drug that contains a member of the atropin series. In other words, it should be recognized that a person taking morphin and atropin in combination acquires the atropin habit as well as the morphin habit. This is not generally understood.

SYMPTOMS OF THE OPIUM HABIT

The contraction of the pupil is, of course, observed by all, and its inability to dilate properly when light is excluded is well known. Those persons who have the opium habit in any form are usually exhilarated soon after the drug is taken and then depressed later as the effects of the drug pass off. This variability of mood, which perhaps changes several times during a day, is therefore very characteristic, and should place the person under suspicion. During this period of depression the drug habitué is likely to retire to a place where he can administer or take the drug without observation, and he returns, after a time, more or less normal or elated. Some persons in a certain length of time after the drug has been taken become very drowsy and almost sleep while talking. This condition is likely to follow the more or less alert phase. Some persons have a great deal of itching from the drug, especially a tickling or itching of the nose. Others sneeze at the time the action of the drug is passing off, and the sneezing will be inhibited when they take another dose.

Pettey thinks that an indication that a person is taking cocain as well as morphin is that he walks rapidly and in a zigzag manner, shows great nervousness and fidgetiness, is excessively talkative, and has a variable appetite, sometimes eating enormously and again not eating at all. When a patient is excessively restless and moves constantly he thinks that it shows the atropin combination with morphin, and patients who increase the morphin and also the atropin are likely to suffer from insomnia. He also notes that if the atropin is removed in such a morphin-atropin addiction the ordinary dose of morphin causes extreme nausea. In other words, such a patient suffers from the morphin without the atropin.

Pettey thinks it inexcusable to cause the symptoms usually attendant on the gradual reduction of morphin. He also finds it inexcusable to withdraw the opiate abruptly, unless the patient is first prepared for such treatment. Such harsh treatment is not likely to cure a patient permanently. He is also firmly convinced that the more thoroughly the system is cleansed of toxic matter, that is, prepared for the treatment of the withdrawal of the drug, the less fever there will be and the less neuralgic pain.

Pettey believes strongly in the necessity of reducing the toxins in the system, not only those caused by the drug, but also those produced in the intestines owing to the action of the drug; and he believes that these toxins accumulate in the system mainly because there is deficient excretion. This insufficient excretion is largely due to the fact that the intestines are so seriously affected by the narcotic, in their secretions, muscularly, in their nervous supply and in all their nerve centers. He is convinced, therefore, that no ordinary simple catharsis is sufficient, but that not only should the intestines be thoroughly emptied, but that the secretions, also, should be started if possible, the peristalsis activated and the circulatory and motor nerve centers, if possible, stimulated. He therefore administers a combination of drugs that will promote all of these desired effects, and he finds that, if the nerve centers are not at the same time stimulated, the cathartic drugs will cause pain and disturbance without efficient evacuation of the bowels. Pettey also believes that the cardiac depression caused by withdrawing morphin or some other form of opium is largely due to portal and liver congestion. Such congestion, of course, is well known to interfere with cardiac efficiency; or the reverse, which is so generally understood, that cardiac insufficiency will cause portal congestion. If, therefore, he can relieve portal congestion and liver obstruction, he finds that the circulation misses the morphin less.

A general hyperesthesia or hypersensitiveness follows the withdrawal of an opiate from the habitué, and this of course he points out as the natural reaction from a more or less chronic anesthesia due to the drug. He finds this hyperirritability in all parts of the body, evidenced not only mentally and nervously, but also functionally.

The suffering always attendant on the withdrawal of the opiate can be prevented by previous thorough elimination and the administration of scopolamin. The proper use of scopolamin for the few days it is required will relieve pain, induce sleep and prevent the distressing nervous symptoms due to the withdrawal of the opiate. Pettey finds that with this treatment in two or three days after the withdrawal of the opiate there is no craving or desire for the drug, the appetite returns, the patient will sleep many hours at a time, and convalescence becomes rapid.

"The dose of scopolamin ranges from 1/300 to 1/50 grain at intervals of from thirty minutes to six hours, depending on the individual." Of course the smaller doses should at first be administered until the tolerance of the patient is determined. The frequency is determined by the production of sleep and the freedom from pain. After this condition is produced the drug should be given at such intervals only as are necessary to keep the patient comfortable. In the use of this drug the patient should always be individualized. There is, and can be, no rule as to the dosage or the frequency, but the withdrawal of the opiate should not be allowed to cause suffering, and this drug will prevent it.

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[1] Pettey, George E.: The Narcotic Drug Diseases and Allied Ailments, F. A. Davis Company, Philadelphia.

PREPARATION OF THE PATIENT

The patient should first receive some hydrotherapeutic treatment, the intensity of which is determined by the patient's strength, perhaps only a tub-bath, followed by a vapor-bath. He should be made to drink a large amount of water in order to wash out all surplus metabolic products that it is possible to eradicate by the urine; but it should be remembered that bile and bowel-discharges are nine times as toxic as the urine, and that urine is fifty times as toxic as the perspiration (Bouchard), and that the principal elimination of toxins, must therefore be from the bowels, and purgation is of primary importance. The cathartic combination found most valuable by Pettey is the following:

℞ Calomel ....
Powdered extract of cascara......āā gr. x
Ipecac ....gr. I
Strychnin nitrate ....gr. 1/4
Atropin sulphate ....gr. 1/50
M. et fac capsulas 4.

Sig.: One capsule every two hours until four are taken, preferably at 4, 6, 8 and 10 p. m., and only after having abstained from dinner and supper on the day on which they are taken.

The treatment may be begun at 4 p. m. with one capsule; the last dose is given at 10 p. m. The patient receives his opiate in his usual dose up to 8 or 10 p. m., but none from that time until after the bowels have thoroughly moved the following morning. Pettey thinks it is advisable that six or eight hours after the last capsule has been given, namely, at 10 p. m., the patient should receive 1/20 grain of strychnin hypodermically, this to be followed half an hour later by 2 ounces of castor oil or a bottle of citrate of magnesium. "Both the strychnin and the oil or saline should be repeated at intervals of two hours until the intestinal canal has been thoroughly emptied." The patient receives no morphin or narcotic during this period. When he has gone as long as he can without discomfort and begins to feel the need of the drug, it should be given him in reduced doses, and it will generally be found that two-thirds of the usual dose perfectly satisfies his system. This reduced quantity should be given at the same intervals at which the patient has been having his morphin before the treatment was begun. After purgation is completed, the patient may be allowed a liberal diet until within six or eight hours of the time of giving the next course of purgative. Forty-eight hours from the time of the first purgative course the second course should be given, consisting of the same ingredients. As stated before, after the first purgative action the patient should receive his morphin in as small doses as will keep him comfortable up to the time of his evening or bedtime dose on this the second day, but he should receive no morphin or other opiate after taking the last purgative capsule of the second course. Again, six or eight hours after taking the last purgative capsule he should again receive his strychnin and his oil or saline, and this dose should be repeated until free bowel movement has been obtained. During this time the patient should be given a bath and put to bed. After this purgation and the elimination of the toxins that it causes he will be able to go much longer before he has the desire for the narcotic, especially if he remains in bed, which should be insisted on. In six or eight hours, however, after the usual time for his morning dose he will begin to require something for his relief. At this time instead of being given the opiate, he is given scopolamin in 1/200-grain doses, hypodermically, and the same dose is repeated in thirty minutes. Ordinarily a patient will go to sleep in half an hour after the second dose. If he does not, and still complains of discomforts, the third dose of the same size should be given. If he is not uncomfortable, however, he should not receive the third dose until an hour after the second dose. At the end of that time, however, he should receive a third dose. This dose, in patients who are not uncomfortable, may be of the same size or increased in size, depending on the amount of impression produced by the other doses. Of course, a patient may be susceptible to the action of scopolamin, or he may be tolerant to it, but if he is poisoned slightly by it (belladonna poisoning) he will not suffer from the need of his morphin.

The patient should be allowed to sleep from six to eight hours, unless he awakens before, but when he does awake, no matter how comfortable he may be, he should receive another dose of scopolamin, generally 1/200 grain. The amount is regulated by the susceptibility of the individual. This drug is then repeated at such intervals as are required to keep up a mild belladonna intoxication and keep the patient free from pain. He may sleep, or he may not.

This treatment with scopolamin should be continued for from thirty-six to forty-eight hours from the time of beginning the remedy and then stopped.

Pettey believes it generally advisable during the time of the administration of scopolamin to give 20 grains of sodium thiosulphate (sodium hyposulphite) every two hours for twenty-four hours or more (of course provided the patient is not comfortably sleeping), finding that this drug supplements the effect of the calomel purge and will cause bilious stools unattended by colic or griping.

At the end of the fifth or sixth day the patient is convalescent, and has no desire for the drug to which he is addicted, although, of course, he is weak and will miss the support of his usual stimulant. "The usual symptoms attendant on the withdrawal of morphin are not present, such as diarrheas, disturbed heart, nerve-pains, muscle-aches, nervousness and flushings, and the patient can lie comfortably in bed and take and enjoy his nourishment."

If the heart-action is deficient during this treatment, spartein sulphate in doses of 2 grains at intervals of from four to six hours is the medication Pettey advises.

The convalescence should be protracted; namely, from one to two months should be spent under the direct supervision of the physician, preferably in an institution accustomed to treat such patients. The after-treatment from the period just described on to complete health is the usual one for neurasthenics, namely, food, rest, physical treatments and more or less exercise.

Patients thus treated have a short convalescence, gain in weight, sleep well and are not injured by the ordeal of the withdrawal of the drug.

The convalescent patient should receive no drugs, unless there is some specific reason for administering them. Alcohol should be absolutely withheld. The same is true of strychnin. Alcohol is followed by depression, and its dulling effect on the nervous irritability is only short-lived. As previously stated, the nervous system is hyperesthetic after the withdrawal of the narcotic, and to stimulate it continuously with strychnin is a mistake.

If the heart-action becomes weak during the treatment, Pettey advises the use of spartein sulphate, 1 to 2 grains, hypodermically, every four to six hours. He finds that this drug acts better in sustaining the circulation after the withdrawal of morphin than any other drug.

Pettey discusses the large doses of strychnin which he advises, and finds that the larger the daily dose of morphin the more strychnin will be required to wake up the inert nerve-centers and to cause satisfactory catharsis and nutritional activities, and he is sure that failure to use sufficiently large doses of strychnin has sometimes caused failure in complete evacuation of the intestines and complete elimination of toxins.

Pettey discusses the use of scopolamin, and even goes so far as to state "that its relationship to the treatment of morphinism is the same as the relationship of ether to surgery." In other words, it inhibits pain and suffering.

We have long maintained[2] that some member of the atropin series was always used in the successful treatment of morphinism. Which particular form of the atropin group is to be used has varied with the different specialists in this line, but undoubtedly scopolamin offers the desired antagonistic effect to the morphin; namely, it causes nervous stimulation through its atropin constituent while at the same time it causes mental quietude as other forms of the atropin group do not.

Pettey finds that pregnancy is no bar to his treatment for the morphin habit, although he would take a longer time in the preparation of the patient for the withdrawal of the drug. He finds that scopolamin will arrest uterine activity.

New and Nonofficial Remedies

The following additional articles have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association. Their acceptance has been based largely on evidence supplied by the manufacturer or his agent and in part on investigation made by or under the direction of the Council. Criticisms and corrections are asked for to aid in the revision of the matter before publication in the book "New and Nonofficial Remedies."

The Council desires physicians to understand that the acceptance of an article does not necessarily mean a recommendation, but that, so far as known, it complies with the rules adopted by the Council.

W. A. Puckner, Secretary.

DIGIPURATUM AMPULES.—This dosage form of an accepted proprietary article has been accepted.

Each ampule contains 1 Cc. of a digipuratum solution, faintly alkaline and isotonic with the body fluids, equivalent to .1 gram (1½ grains) digipuratum.

DIGIPURATUM SOLUTION FOR ORAL USE.—This dosage form of an accepted proprietary article has been accepted.

Vials containing 10 [illegible] on, each Cc. representing .1 gram (1½ [illegible] The solution for oral use must not be [illegible]

TETANUS ANTITOXIN (See N. N. R., 1913. p. 218).

H. M. Alexander and Co., Marietta, Pa.

Tetanus Antitoxin.—This product is concentrated and refined according to the method of Banzhaf. It is standardized under the method approved by the Hygienic Laboratory of the United States Public Health Service. *Marketed* in a syringe containing 1500 units—a single immunizing dose.

ACNE VACCINE (See N. N. R., 1913, p. 221).

Lederle Antitoxin Laboratories, New York City. (Schieffelin and Co., New York.)

Acne Vaccine.—This product is marketed in five syringes containing respectively 5 million, 10 million, 20 million, 40 million and 100 million killed acne bacteria. Also marketed in four packages of two vials, each containing 5 million, 10 million, 20 million and 40 million killed bacteria. Also marketed in 20 Cc. vials in four strengths, 1 Cc. containing respectively 5 million, 10 million, 20 million and 40 million acne bacilli.

BACILLUS BORDET-GENGOU VACCINE.

Lederle Antitoxin Laboratories, New York City. (Schieffelin and Co., New York.)

Pertussis Vaccine.—This product is marketed in four syringes containing respectively, 25 million, 50 million, 100 million and 200 million killed Bordet-Gengou bacilli. Also marketed in four packages of two vials, each containing 25 million, 50 million, 100 million and 200 million killed bacteria. Also marketed in 20 Cc. vials in four strengths, 1 Cc. containing respectively 25 million, 50 million, 100 million and 200 million pertussis bacteria.

MENINGOCOCCUS VACCINE (See N. N. R, 1913, p. 223).

Lederle Antitoxin Laboratories, New York City. Schieffelin and Co., New York.)

Meningococcus Vaccine.—This product is marketed in a package containing three syringes: syringe 1 containing 500 million killed meningococci, while syringes 2 and 3 contain each 1 billion killed meningococci. The contents of these syringes should be injected subcutaneously at intervals of ten days. Also marketed in a package containing three vials: vial 1 containing 500 million and vials 2 and 3 containing each 1 billion killed meningococci.

BACILLUS COLI VACCINE (See Jour. A. M. A., May 10. 1913, p. 1461).

Lederle Antitoxin Laboratories, New York City. (Schieffelin and Co., New York.)

Coli Vaccine (Polyvalent).—Marketed in 20 Cc. vials in four strengths, 1 Cc. containing respectively 50 million, 100 million, 200 million and 400 million killed bacilli.

GONOCOCCUS VACCINE (See Jour. A. M. A., May 10, 1913, p. 1461).

Lederle Antitoxin Laboratories, New York City. (Schieffelin and Co., New York.)

Gonococcus Vaccine (Polyvalent).—Marketed in 20 Cc. vials in four strengths, 1 Cc. containing respectively 50 million, 100 million, 200 million and 400 million killed gonococci.

PNEUMOCOCCUS VACCINE (See Jour. A. M. A., May 10, 1913, p. 1461).

Lederle Antitoxin Laboratories, New York City. (Schieffelin and Co., New York.)

Pneumococcus Vaccine (Polyvalent).—Marketed in 20 Cc. vials in four strengths, 1 Cc. containing respectively 50 million, 100 million, 200 million and 400 million killed pneumococci.

STAPHYLOCOCCUS VACCINES (See Jour. A. M. A., May 10, 1913, p. 1461.

Lederle Antitoxin Laboratories, New York City. (Schieffelin and Co., New York.)

Staphylococcus Vaccine (Polyvalent).—Marketed in 20 Cc. vials in four strengths, 1 Cc. containing respectively 250 million, 500 million, 1 billion and 2 billion killed staphylococci.

Staphylococcus Albus Vaccine (Polyvalent).—Marketed in 20 Cc. vials in four strengths, 1 Cc. containing respectively 250 million, 500 million, 1 billion and 2 billion killed staphylococcus albus.

Staphylococcus Aureus Vaccine (Polyvalent).—Marketed in 20 Cc. vials in four strengths, 1 Cc. containing respectively 250 million, 500 million, 1 billion and 2 billion killed staphylococcus aureus.

STREPTOCOCCUS VACCINE (See Jour. A. M. A., May 17, 1913, p. 1541).

Lederle Antitoxin Laboratories, New York City. (Schieffelin and Co., New York.)

Streptococcus Vaccine (Polyvalent).—Marketed in 20 Cc. vials in four strengths, 1 Cc. containing respectively 50 million, 100 million, 200 million and 400 million streptococci.

TYPHOID VACCINE (See Jour. A. M. A., May 17, 1913, p. 1541).

Lederle Antitoxin Laboratories, New York City. (Schieffelin and Co., New York.)

Typhoid Vaccine.—Marketed in 20 Cc. vials in four strengths, 1 Cc. containing respectively 100 million, 250 million, 500 million and 1 billion killed typhoid bacilli.

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[2] The Drug Treatment of Alcohol, Morphin and Cocain Habitués, Therapeutics, The Journal A. M. A., March 5, 1910, p. 794.

MEDICAL COLLEGES OF THE UNITED STATES

ANNUAL PRESENTATION OF EDUCATIONAL DATA BY THE COUNCIL ON MEDICAL EDUCATION

Below are given brief descriptions of the medical colleges in the United States and Canada that are legally chartered to teach medicine, several of which do not grant degrees. The name, address, year of organization, history and date when first class graduated are given in each instance. Unless otherwise stated, a class graduated each subsequent year. Where official reports have been received from the college, information regarding faculty, entrance requirements, length of term, fees, students (excluding specials and postgraduates) graduates, name of dean and next session is given without discrimination, regardless as to whether the college is sectarian or not. In a few instances in which such reports were not received the information published is from other reliable sources. Figures for graduates include all who graduated since July 31, 1912. Extracts of rules and the membership of the Association of American Medical Colleges are shown following the list of colleges. Figures showing population of cities and states are taken from the United States Census Bureau's returns for 1910.

ALABAMA

Alabama, population 2,138,093, has two medical colleges, the Medical Department of the University of Alabama and the Birmingham Medical College, located, respectively, in Mobile and Birmingham. The population of Mobile is 51,521 and of Birmingham 132,685.

Birmingham

BIRMINGHAM MEDICAL COLLEGE, Avenue F and Twentieth Street. —*Chartered in 1894.* The first class graduated in 1895. In 1913 became the Graduate School of Medicine of the University of Alabama. There are 25 professors and 15 assistants, total 40. The course of undergraduate instruction now embraces two sessions of eight months each. Only juniors and seniors will be enrolled. When then two classes have graduated, the college will cease to do undergraduate teaching. The fees are $105 for the third year and $130 for the fourth. The Secretary is Dr. E. P. Hogan. Registration, 1912-1913, 102; graduates, 28. The twentieth session *begins Oct. 1, 1913, and ends May 21, 1914.*

Mobile

UNIVERSITY OF ALABAMA SCHOOL OF MEDICINE, St. Anthony and Lawrence Streets.—Organized in 1859 as the Medical College of Alabama. Classes were graduated in 1861 and in all subsequent years except 1862 to 1868, inclusive. It was reorganized as the Medical Department of the University of Alabama in 1897. All property was transferred to the University of Alabama in 1907, when the present title was assumed. After Jan. 1, 1914, one year and, for the session of 1915-16, two years of college work will be required for admission. The faculty consists of 14 professors and 43 lecturers and assistants, a total of 57. The course of study covers four years of thirty-two weeks each. The total fees for each of the four years, respectively, are $150, $145, $145 and $165. The Dean is Dr. Eugene D. Bondurant. The total registration for 1912-13 was 115; graduates, 21. The forty-eighth session begins Sept. 22, 1913, and ends May 28, 1914.

ARKANSAS

Arkansas, population 1,574,449, has one medical college, the Medical Department of the University of Arkansas, located in Little Rock, a city of 45,941.

UNIVERSITY OF ARKANSAS MEDICAL DEPARTMENT, Second and Sherman Streets.—Organized in 1879 as the Medical Department of Arkansas Industrial University. It assumed the present title in 1899. In 1911 the College of Physicians and Surgeons united with it and the new school was made an integral part of the University of Arkansas. The first class graduated in 1880. The faculty consists of 17 professors and 34 lecturers and assistants, total 51. The course of study covers four years of thirty-two weeks each. The *fees* are $125 for each of the first three years and $150 for the fourth year. The Dean is Dr. Morgan Smith. *Total registration,* 1912-13 was 110, graduates 32. The thirty-fifth session begins Sept. 15, 1913, and ends May 14, 1914.

CALIFORNIA

California, population 2,337,459, has eight medical colleges. Four are located in San Francisco, a city of 416,912 inhabitants. They are Leland Stanford Junior University College of Medicine, Medical Department of the University of California, Hahnemann Medical College of the Pacific and the College of Physicians and Surgeons. The College of Physicians and Surgeons and the California Eclectic Medical College and the Los Angeles Clinical Department of the University of California are situated in Los Angeles, population 319,198. The Oakland College of Medicine and Surgery is in Oakland, population 150,174. The College of Medical Evangelists is located at Loma Linda, a village of 110 people.

Berkeley-Los Angeles-San Francisco

UNIVERSITY OF CALIFORNIA MEDICAL DEPARTMENT. University Campus, Berkeley; Second and Parnassus Avenues, San Francisco, and Buena Vista and Alpine Streets, Los Angeles.—Organized in 1863 as the Toland Medical College. The first class graduated in 1865. In 1872 it became the medical Department of the University of California. In 1909 the College of Medicine of the University *of Southern California, at Los Angeles, by legislative enactment,* became a clinical department. Two years of collegiate work are required for admission. The work of the first two years is given at Berkeley and the work of the last two years at both Los Angeles and San Francisco. Of the *Berkeley-San Francisco* portion the faculty is composed of 14 professors and 42 associates and assistants, a total of 56. The course covers four years of nine months each. Fees for the four years respectively are $165, $175, $160 and $160. The Dean is Dr. Herbert C. Moffit, San Francisco. Total registration for 1912-13 was 104; graduates 8. The forty-first session begins Aug. 18, 1913, and ends May 15, 1914. *Los Angeles Clinical Department.* The faculty has 30 professors and 31 associates and assistants, a total of 61. The two clinical years only are given. The Dean is Dr. W. Jarvis Barlow, Los Angeles. Total registration 1912-13, 7; graduates, 4. The next session begins Aug. 22, 1913, and ends May 15, 1914.

Loma Linda

COLLEGE OF MEDICAL EVANGELISTS.—Organized in 1909. The faculty numbers 11. The course extends over five years of nine months each, but includes a study of the Bible *and evangelistic training—non-medical subjects. The total fees* each year are $111; matriculation fee, $5, payable but once: graduation fee, $10. The Dean is Dr. George Knapp Abbott. The total registration for 1912-13 was 62; no graduates. The fifth session begins Sept. 18, 1913, and ends June 17, 1914.

Los Angeles

COLLEGE OF PHYSICIANS AND SURGEONS, 516 East Washington Street.—Organized in 1903, first class graduated in 1905; became Medical Department, University of Southern California August 11, 1909. The course covers four years of nine months each. The faculty consists of 15 professors and 44 associate professors, lecturers and instructors a total of 59. The fees for the *four years* respectively are $160, $157, $155 and $182. The Dean is Charles W. Bryson, Delta Building, Los Angeles. The registration for 1912-13 was 125, graduates 26. The next session begins Sept. 10, 1913, and ends June 11, 1914.

CALIFORNIA ECLECTIC MEDICAL COLLEGE, 846 Lyon Street.—Organized in 1879 at Oakland as the California Medical College. Removed to San Francisco in 1887. *Suspended in 1906.* Reorganized at Los Angeles with the present title in 1907. Classes were graduated in 1880, and in all subsequent years except 1907. It has a faculty of 30. The Dean is Dr. J. A. Munk. The registration for 1912-13 was 20; graduates, 4. The thirty-fifth session begins September 16, 1913, and ends May 22, 1914.

Oakland

OAKLAND COLLEGE OF MEDICINE AND SURGERY, Thirty-First and Grove Streets.—Organized in 1900, opened in 1902. The first class graduated in 1906. The faculty numbers 34. The course covers five years of nine months each, and the *classes are limited* to ten students each. The total fees for each of the five years respectively are $210, $200, $175 *and* $175. The Registrar is Dr. Edward N. Ewer. The total registration for 1912-13 was 13, graduates 4. The *twelfth session* begins Aug. 18, 1913, and ends June 1, 1914.

San Francisco

HAHNEMANN MEDICAL COLLEGE OF THE PACIFIC. Homeopathic. Sacramento and Maple Streets.—Organized in 1881 as the Hahnemann Medical College. The first class graduated in 1884. In 1888 it became the *Hahnemann Hospital College* of San Francisco. It assumed the present name in 1902. *It has a faculty of 12 professors and 23 lecturers, instructors, etc., a total of 35. The course covers four years of thirty-four weeks each.* Total fees for the first year are $155, and $100 for each *of the other three.* The Dean is Dr. James W. Ward, 391 Sutter Street. The total registration for 1912-13 was 38, graduates 16. The thirty-second session begins Aug. 12, 1913, and ends April 1, 1914.

COLLEGE OF PHYSICIANS AND SURGEONS, 344 Fourteenth Street. —Organized in 1896. The first class graduated in 1897. The faculty numbers 39. The course covers four years of nine months each. The fees for each *of the* four years respectively are $165, $160, $160 and $185. The Dean is Dr. Ethan H. Smith. Registration for 1912-13 was 16; graduates, 3. The seventeenth session begins Sept. 2, 1913, and ends June 4, 1914.

San Francisco-Palo Alto

Leland Stanford Junior University, Department of Medicine, University Campus, Palo Alto, and Sacramento and Webster Streets, San Francisco.—Organized in 1908 when, by an agreement, the interests of Cooper Medical College were taken over. The latter continued teaching until 1912 when all the classes enrolled prior to the merger had been graduated. The faculty consists of 27 professors and 24 lecturers, assistants, etc., a total of 51. Three years of collegiate work are required for admission. The course covers four years of nine months each. Students matriculating in September, 1914, and thereafter will be required to take a five year course including a year of practical or intern work prior to graduation. The total fees for each of the first and second years are $160, for the third and fourth years, $150 each. The Dean is Dr. R. L. Wilbur, San Francisco. The total registration for 1912-13 was 53; graduates 7. The next session begins Sept. 3, 1913, and ends May 14, 1914.

COLORADO

Colorado, with a population of 799,024, has one medical college, the University of Colorado School of Medicine. The first two years of the course are given at Boulder, the seat of the university, while the last two, or clinical years, are given in Denver, which has a population of 213,381.

Boulder-Denver

University of Colorado School of Medicine.—Organized in 1883. Classes were graduated in 1885 and in all subsequent years except 1898 and 1899. Denver and Gross College of Medicine was merged Jan. 1, 1911, when the legal right to teach the last two or clinical years in Denver was secured. The faculty embraces 51 professors and 19 lecturers and assistants, a total of 70 The work embraces a graded course of four years of nine months each. The entrance requirements are two years of college work counting toward a degree in arts in an accredited college or university. The tuition is $75 per year; there are no other fees. The Dean is Dr. William P. Harlow. The total registration for 1912-13 was 90; graduates, 50. The thirty-second session begins Sept. 8, 1913, and ends June 3, 1914.

CONNECTICUT

Connecticut, with a population of 1,114,756, has one medical college, located in New Haven, population 133,605.

New Haven

Yale Medical School, York and Chapel Streets.—This is the Department of Medicine of Yale University. In 1810 a charter was granted for the establishment of this school, and in 1813 it was organized as the Medical Institution of Yale College. The first class graduated in 1814. The faculty consists of 17 professors and 42 lecturers and assistants, a total of 59. The requirement for admission is two full years of collegiate work plus evidence of satisfactory preparation in physics, general inorganic chemistry and general biology. The course covers four years of nine months each. The fees for the four years respectively are approximately $220, $168, $150 and $163. The Dean is Dr. George Blumer. The total registration for 1912-13 was 42; graduates, 9. The 101st session begins Sept. 25, 1913, and ends June 17, 1914.

DISTRICT OF COLUMBIA

Washington, population 331,069, has three medical colleges: George Washington University Department of Medicine, Georgetown University School of Medicine and Howard University School of Medicine.

Washington

George Washington University Department of Medicine, 1325 H Street, N.-W.—Organized in 1825 as the National Medical College, Medical Department of Columbian College. Classes were graduated in 1826 and in all subsequent years, except 1834 to 1838, and 1861 to 1863, inclusive. The original title was changed to Medical Department of Columbian University in 1873. In 1904, by an act of Congress, it received its present title. The faculty is composed of 22 professors and 50 instructors, demonstrators and assistants, a total of 72. The course covers four years of thirty-two weeks each. The total fees are $150 per year. The Dean is Dr. William C. Borden. The total registration for 1912-13 was 103; graduates, 11. The 92d session begins Sept. 24, 1913, and ends June 10, 1914.

Georgetown University School of Medicine,, 920 H Street, N.-W.—Organized in 1851. The first class graduated in 1852. The faculty contains 24 professors, 30 instructors and assistants; total 54. Two years of collegiate work are required for entrance. The course of study covers four terms of eight and one-half months each. The fees for the first year are $165, and for each of the other three years, $150. The Dean is Dr. George M. Kober. The registration for 1912-13 was 126; graduates 29. The 63d session begins Sept. 27, 1913, and ends June 13, 1914.

Howard University School of Medicine, Fifth and W Streets, N.-W.—Chartered in 1867. Organized in 1869. The first class graduated in 1871. Colored students compose a majority of those in attendance. The faculty comprises 19 professors and 22 lecturers and assistants, 41 in all. The admission requirements are one year of collegiate work including physics, chemistry, botany and zoology and a reading knowledge of one modern language besides English. The course covers four years of thirty weeks each. The fees of each of the four sessions respectively are $107, $102, $102 and $109. The Dean is Dr. Edward A. Balloch. Registration for 1912-13 was 122; graduates, 21. The 46th session begins Oct. 1, 1913, and ends June 3, 1914.

GEORGIA

Georgia, population 2,609,121, has four medical colleges; Medical College of Georgia, located in Augusta, population 41,040; Atlanta Medical College, the Georgia College of Eclectic Medicine and Surgery, and the Southern College of Medicine and Surgery are in Atlanta, a city of 154,839 population.

Atlanta

Atlanta Medical College.—Butler and Armstrong Streets.—Organized in 1854. Classes graduated, 1855 to 1861, when it suspended. Reorganized in 1865. In 1898 it merged with the Southern Medical College (organized in 1878) taking the name of Atlanta College of Physicians and Surgeons. In 1913 it merged with the Atlanta School of Medicine (organized in 1905), reassuming its first title. It has a faculty of 34 professors and 70 instructors, assistants, etc., a total of 104. The course of study is four years of thirty-two weeks each. The fees are $150 each year. The dean is Dr. W. S. Elkin. Total registration for the two colleges for 1912-13 was 560; graduates, 121. The next session begins Sept. 29, 1913, and ends June 1, 1914.

Georgia College of Eclectic Medicine and Surgery, Tanner Street, near Edgewood Avenue.—Organized in 1877 as the Georgia Eclectic Medical College. In 1884 it acquired the charter of the College of American Medicine and Surgery. It assumed its present name in 1886. The first class graduated in 1878. The faculty consists of 13 professors and 6 assistants, a total of 19. Tuition is $80 per year; graduation fee, $25. The Proctor is Dr. E. B. Thomas. Total registration for 1912-13 was 70; graduates, 42. The next session begins Sept. 20, 1913, and ends April 13, 1914.

Southern College of Medecine and Surgery, McDaniel Street. —Organized in 1911. The faculty numbers 13. Total registration for 1912-13, 53; graduates, 15. The Dean is Dr. W. B. Lingo.

Augusta

University of Georgia, College of Medicine, Railroad Avenue and Harper Street.—Organized in 1828 as the Medical Academy of Georgia, the name being changed to the Medical College of Georgia in 1829. Since 1873 it has been known as the Medical Department of the University of Georgia. Entire property transferred to the University in 1911. Classes were graduated in 1833 and in all subsequent years except 1862 and 1863. The faculty includes 23 professors and 28 assistants, 51 in all. Entrance requirements beginning Jan. 1, 1914, will be two years of collegiate work. The course is four years of eight months each. Fees for each of the four years respectively are $140, $135, $125 and $150. The Dean is Dr. W. H. Doughty, Jr. The total registration for 1912-13 was 80; graduates, 27. The 20th session begins Sept. 17, 1913, and ends May 27, 1914.

ILLINOIS

Illinois, population 5,638,591, has seven medical colleges, one of which gives instruction at night, all located in Chicago, a city of 2,185,283 inhabitants, and are as follows: Rush Medical College, Northwestern University Medical School, University of Illinois College of Medicine, Hahnemann Medical College, Bennett Medical College, Jenner Medical College and Chicago College of Medicine and Surgery.

Chicago

Rush Medical College.—This school was founded in 1837, organized in 1843, was the medical department of Lake Forest University from 1887 until 1898, when it became affiliated with the University of Chicago. The first class graduated in 1844. The faculty is composed of 103 professors, 151 associates, instructors etc., a total of 254. The requirements for admission are two years of college work, including courses in college chemistry, physics and biology, and a reading knowledge of German or French. The course covers four years of eight and a half months each. A fifth year, consisting of a hospital internship or of a fellowship in one of the departments, will be required of all students matriculating for the summer quarter of 1914 and thereafter. All freshmen and sophomore studies are given at the University of Chicago. The last two years are given in the clinical building at the corner of Wood and Harrison Streets. The total fees are $180 each year. A matriculation fee of $5 is paid but once, and there are incidentals amounting from $2 to $5 annually. The Dean is Dr. John M. Dodson. Total registration 1912-13 was 422; graduates, 95. The 71st session begins Oct. 1, 1913, and ends June 10, 1914.

Northwestern University Medical School, South Dearborn Street, between Twenty-fourth and Twenty-Fifth Streets.—Organized in 1859 as the Medical Department of Lind University. In 1864 it became independent as the Chicago Medical College. It united with Northwestern University in 1869, but retained the name of Chicago Medical College until 1891, when the present name was taken. The faculty comprises 55 professors and 83 lecturers and assistants, a total of 138. The requirements for admission are such as will admit to the College of Liberal Arts of Northwestern University plus two years of college work including courses in physics, chemistry, biology and modern languages. The course covers four years of eight months each. The fees for the four years respectively are $200, $200, $191 and $185. The Dean is Dr. Arthur R. Edwards. The total registration for 1912-13 was 196; graduates, 56. The 54th session begins Sept. 30, 1913, and ends June 6, 1914.

University of Illinois College of Medicine, Honore and Congress Streets.—Organized in 1882 as the College of Physicians and Surgeons. The first class graduated in 1883. It became the Medical Department of the University of Illinois by affiliation in 1896 and an integral part in 1910. The relationship with the university was canceled in June, 1912, but restored in March, 1913. The American Medical Missionary College was absorbed in 1910. The faculty is composed of 40 professors, 93 assistants and instructors, a total of 133. The fees are $155 each year. The Dean is Dr.

William E. Quine. Total registration for 1912-13 was 535; graduates, 133. The 32d session begins Oct. 1, 1913, and ends June 9, 1914.

Chicago College of Medicine and Surgery, 706 South Lincoln Street.—Organized in 1901 as the American College of Medicine and Surgery (Chicago Eclectic Medical College). The latter part of the name was dropped in 1902 and it became the Medical Department of Valparaiso University. Eclecticism was dropped in 1905. The name was changed to the above in 1907. The course covers four years of eight months each. The faculty numbers 138. The total fees of each of the four years are $100. The Registrar is Dr. G. E. Wyneken. The total registration for 1912-13 was 642; graduates 188. The 13th session begins Sept. 30, 1913, and ends May 25, 1914.

Hahnemann Medical College and Hospital of Chicago, 2811 Cottage Grove Avenue.—Organized in 1859. The first class was graduated in 1861. The faculty includes 29 professors and 41 lecturers, assistants, etc., a total of 70. The course extends over four years of eight months each. The tuition fees for the four years respectively are $125, $125, $155 and $175. The Registrar is Dr. W. Henry Wilson. The total registration for 1912-13 was 76; graduates 31. The 54th session begins Sept 29, 1913, and ends May 28, 1914.

Bennett Medical College, Fulton and Ada Streets.—Organized in 1868 as the Bennett College of Eclectic Medicine and Surgery. Dropped Eclecticism in 1909. In 1910 it united with the Illinois Medical College and became by affiliation the Medical Department of Loyola University. The first class graduated in 1870. The faculty numbers 86. The course covers four years of thirty-four weeks each. The fees for the four years respectively are $150, $150, $125 and $175. The Dean is Dr. Maximillian Herzog. The total registration for the two colleges in 1912-13 was 395; graduates, 43. The next session begins Oct. 1, 1913, and ends June 20 1914.

Jenner Medical College, an afternoon and night school, located at 223 West Washington Street.—Organized in 1892. Classes were graduated in 1896 and in all subsequent years. The faculty numbers 48. The Secretary is Dr. John D. MacKellar. Total registration for 1912-13, 191; graduates, 11. The next session begins Sept. 2, 1913, and ends June 13, 1914. *Official statements received indicate that diplomas from this college are not recognized by the licensing boards of twenty-nine states.*

INDIANA

Indiana, population 2,700,876, has one medical college, the Indiana University School of Medicine, located at Indianapolis, a city of 233,650 people, except that the work of the first year is offered also at Bloomington, the seat of the University.

Bloomington and Indianapolis

Indiana University School of Medicine.—Organized in 1893, medical course until 1905. In 1907, by union with the State College of Physicians and Surgeons, the complete course in medicine was offered. In 1908 the Indiana Medical College, which was formed in 1907 by the merger of the Medical College of Indiana (organized in 1869) and the Fort Wayne College of Medicine (organized in 1879) merged into it. The faculty consists of 76 professors and 47 lecturers, associates and assistants, a total of 123. Two years of collegiate work are required for admission The work of the first year is emphasize [illegible] The work of the other three years is all [illegible]es for the four years respectively are $100. [illegible] fifth optional year leading to the "M.D. [illegible] added. The Secretary at Bloomington is Dr. B. D. Myers; the Dean is Dr. Charles P. Emerson, Indianapolis. The total registration for 1912-13 was 146; graduates 47. The next session begins Sept. 25, 1913, and ends June 24, 1914.

IOWA

Iowa, population 2,224,771, has two medical colleges. The College of Medicine and the College of Homeopathic Medicine of the State University of Iowa, both located in Iowa City, population 10,091.

Iowa City

State University of Iowa College of Medicine. University Campus.—Organized in 1869. First session began in 1870. First class graduated in 1871. The faculty is made up of 20 professors, 21 lecturers, demonstrators and assistants, a total of 41. Two years of collegiate work, including courses in physics, chemistry, biology and French or German, are required for admission. The course of study covers four years of thirty-six weeks each. Total fees for each year are $50 plus a matriculation fee of $10 paid but once and a graduation fee of $10. The Dean is Dr. James R. Guthrie, Dubuque. Total registration for 1912-13 was 99; graduates, 16. The 44th session begins Sept. 22, 1913, and ends June 17 1914.

State University of Iowa College of Homeopathic Medicine.—Organized in 1877. The first class graduated in 1878. The faculty is composed of 11 professors and 19 lecturers and assistants, a total of 30. The work of the first two years is taken in classes with the students of the College of Medicine of the State University of Iowa, and it has the same entrance requirements. The fees are $50 each year, plus a matriculation fee of $10, paid but once, and a graduation fee of $10. The Dean is Dr. George Royal. Total registration for 1912-13 was 13; graduates, 6. The 36th session begins Sept. 22, 1913, and ends June 17 1914.

KANSAS

Population 1,690,949, has one medical college. The School of Medicine of the University of Kansas gives its first two years in Lawrence, population 12,915, and the last two years in Rosedale, a suburb of the Two Kansas Cities, which together have a population of 330,662.

Lawrence and Rosedale

University of Kansas School of Medicine.—Organized in 1880. In 1905 it merged with the Kansas City (Mo.) Medical College, founded in 1869, the College of Physicians and Surgeons, founded in 1894, and the Medico-Chirurgical College, founded in 1897. Absorbed Kansas Medical College in 1913. The faculty, including lecturers and clinical assistants, numbers 56. The requirements for admission are two years of collegiate work. The course covers four years of nine months each. The total fees are, for each of the first two years, $30 per year (and for non-residents of the state, $45); for the last two years $100 and $110, respectively. The Dean is Dr. S. J. Crumbine, Topeka; Associate Dean, Dr. M. T. Sudler. The total registration for 1912-13 was 66; graduates, 7. The 34th session begins Sept. 17, 1913, and ends June 10, 1914.

KENTUCKY

Kentucky, population 2,289,905, has one medical college, the University of Louisville Medical Department, situated in Louisville, a city of 223,928 inhabitants.

Louisville

University of Louisville Medical Department, First and Chestnut Streets.—Organized in 1837 as the Louisville Medical Institute. The first class graduated in 1838, and a class graduated in each subsequent year except 1863. In 1846 the present name was assumed. In 1907 it absorbed the Kentucky University Medical Department. In 1908 it absorbed the Louisville Medical College, the hospital College of Medicine and the Kentucky School of Medicine. It has a faculty of 35 professors and 38 lecturers and assistants, a total of 73. After Jan. 1, 1914, two years of collegiate work will be required for admission. The course covers four years of thirty-two weeks each. The fees are $150 for each of the first three years and $160 for the fourth; graduation fee, $25. The Dean is Dr. W. Edward Grant. The total registration for 1912-13 was 255; graduates, 77. The next session begins Oct. 1, 1913, and ends May 29, 1914.

LOUISIANA

Louisiana, having a population of 1,656,388, contains one medical college, the School of Medicine of the Tulane University of Louisiana, situated in New Orleans, a city of 339,075.

New Orleans

School of Medicine of the Tulane University of Louisiana, University Campus and 1551 Canal Street.—Organized in 1834 as the *Medical College of Louisiana.* Classes were graduated in 1835 and in all subsequent years, except 1863-65, inclusive. It was *transferred to Medical Department* of the University of Louisiana in 1847 *and became the* Medical Department of the Tulane University in 1884. The faculty has 21 professors and 96 instructors, *demonstrators, etc., a total of 117.* The course covers four years *of thirty-two weeks each.* One year of collegiate work is required for admission. Total fees are $180 per year; graduation fee, $30. *The Dean is Dr. Isadore Dyer.* The total registration for 1912-13 was 296; *graduates, 79.* The 80th session begins Sept. 29, 1913, and ends June 3, 1914.

MAINE

Maine, population 742,371, has one medical college, located *in Brunswick and Portland,* the latter having a population of 58,571.

Brunswick-Portland

Medical School of Maine. The medical department of Bowdoin College. The first two years are given at Bowdoin College, Brunswick, the last two at Portland, building located on Chadwick Street.—Organized in 1820. The first class graduated in 1820. The faculty numbers 63. The course covers four years of eight months each. The total fees are $120 for the first year and $110 for each of the other three years. *The Dean is Dr. Addison S.* Thayer, 10 Deering Street, Portland. The total number of students in 1912-13 was 75; *graduates,* 13. The 93d session begins Oct. 16, 1913, and ends June 24, 1914.

MARYLAND

Maryland, with a population of 1,295,346, contains three medical colleges, all located in Baltimore, a city with 558,485 inhabitants. They are as follows: Johns Hopkins University Medical Department, School of Medicine of the University of Maryland and the College of Physicians and Surgeons.

Baltimore

Johns Hopkins University Medical Department, Washington and Monument Streets.—Organized *in 1893.* The first class graduated in 1897. The faculty consists of 39 professors and 79 clinical professors, etc., a total of 118. The requirements for admission demand that the applicant either has (a) completed the chemical-biologic course which leads to the A.B. *degree* in the university or (*b*) graduated at an approved college or scientific school and has a knowledge of French and German, *physics,* chemistry and biology, such as may be obtained from a *year's course.* The course extends over four years of eight and one-half months each. The charge for tuition is $200 per annum. *The Dean* is Dr. J. Whitridge Williams. Total registration for 1912-13 was 351; graduates, 76. The 21st session begins Oct. 1, 1913, and ends June 10, 1914.

College of Physicians and Surgeons, Calvert and Saratoga Streets.—Organized in 1872. The first class graduated in 1873.

In 1878 it united with Washington University School of Medicine. The faculty consists of 17 professors and 52 lecturers, demonstrators, etc., a total of 69. The work covers four years of eight months each. Total fees are $165 each year; graduation fee $30. The Dean is Dr. William F. Lockwood. The total number of students registered in 1912-13 was 234; graduates, 60. The 42d session begins Oct. 1, 1913, and ends June 4, 1914.

University of Maryland School of Medicine, Lombard and Greene Streets.—Organized in 1807 as the College of Medicine of Maryland. The first class graduated in 1810. In 1812 it became the University of Maryland School of Medicine. Baltimore Medical College was merged into it in 1913. The faculty numbers 135. The course covers four years of eight months each.. The total fees are $170 each year; graduation fee, $30. The Dean is Dr. R. Dorsey Coale. The total number of students registered in 1912-13 was 293; graduates, 49. The 107th session begins Oct. 1, 1913, and ends June 1, 1914.

MASSACHUSETTS

Massachusetts, population 3,366,416, has four medical colleges: Medical School of Harvard University, Boston University School of Medicine, College of Physicians and Surgeons and Tufts College Medical School. They are all situated in Boston, a city of 670,585.

Boston

Medical School of Harvard University, Longwood Ave.—Organized in 1782. The first class graduated in 1788. It has a faculty of 53 professors and 141 associates, assistants, etc., a total of 194. Candidates for admission must present credits for two years of work in a recognized college or scientific school, which must include courses in physics, chemistry, biology and French or German. The session is four years of nine months each. The total fees for each of the first two years respectively are $234 and $208; for each of the last two years, $200. The Dean is Dr. Edward H. Bradford. The total registration for 1912-13 was 285; graduates, 60. The 132d session begins Sept. 22, 1913, and ends June 18, 1914.

Boston University School of Medicine, 80 East Concord Street.—Organized in 1873. In 1874 the New England Female Medical College, founded in 1848, was merged into it. The first class graduated in 1874. The faculty includes 32 professors, 38 associates, etc., a total of 70. The course covers four years of eight months each. Total fees for the first, second and third years, $125 each, and for the last year $155. The Dean is Dr. John P. Sutherland. Total registration for 1912-13 was 98; graduates, 11. The 41st session begins Oct. 2, 1913, and ends June 3, 1914.

Tufts College Medical School, 416 Huntington Avenue.—Organized in 1893 as the Medical Department of Tufts College. The first class graduated in 1894. It has a faculty of 34 professors and 77 assistants, lecturers, etc., a total of 111. The course covers four years of eight months each. The total fees are $155 each year. The Secretary is Dr. Frederic M. Briggs. Total registration for 1912-13 was 317; graduates, 85. The 20th session begins Sept. 24, 1913, and ends June 1, 1914.

College of Physicians and Surgeons, 517 Shawmut Avenue.—Organized in 1880. The first class graduated in 1882. The college announcement gives the names of 180 "matriculants and applicants" for the session of 1912-13, which included both dental and medical students. The names of some of the students who graduated in 1910 appear in the announcements of this school from six to nine years. The Dean is Dr. Thomas D. Crothers. Total registration for 1912-13 was about 80; graduates, 19. *This college has been reported not recognized by the Massachusetts Medical Society.*

MICHIGAN

Michigan, population 2,810,173, has three medical colleges. Two of these, the University of Michigan Department of Medicine and Surgery and the Homeopathic College of the University of Michigan, are located at Ann Arbor, a city of 14,817 people. The Detroit College of Medicine is located at Detroit, a city of 465,766 inhabitants.

Ann Arbor

University of Michigan Department of Medicine and Surgery.—Organized in 1850. The first class graduated in 1851. It has a faculty composed of 18 professors and 66 associates, instructors, etc., a total of 84. The entrance requirements are two years of college work, including courses in chemistry, physics and biology, with laboratory work, and a reading knowledge of one modern language. The curriculum embraces four years of nine months each. The total fees for Michigan students for the entire course of four years is $350 and for others about $400. The Dean is Dr. Victor C. Vaughan. The total registration for 1912-13 was 221; graduates, 42. The sixty-fourth session begins Sept 30, 1913, and ends June 25, 1914.

University of Michigan Homeopathic College.—Organized in 1875. The first class graduated in 1877. Although the work of the first two years is taken in the same classes with the Department of Medicine and Surgery of the University of Michigan, nevertheless the entrance requirements have been kept at one year of collegiate work and even then with an allowance of conditions in as much as eight hours, the requirements for the other departments are two years of collegiate work. The Dean is Dr. W. B. Hinsdale. The total registration for 1912-13 was 63; graduates, 13. The next session begins Sept. 30. 1913, and ends June 25, 1914.

Detroit

Detroit College of Medicine, St. Antoine, Catherine and Mullett Streets and Gratiot Avenue.—Organized in 1885 by consolidation of Detroit Medical College, organized in 1868, and the Michigan College of Medicine, organized in 1880. The first class graduated in 1886. The faculty embraces 23 professors, 102 lecturers, instructors, etc., a total of 125. The course covers four years of eight months each. The Registrar is Dr. F. B. Walker. The total registration for 1912-13 was 197; graduates, 27. The twenty-ninth session begins Sept. 7, 1913, and ends June 4, 1914.

MINNESOTA

Minnesota, population 2,075,708, contains one medical school, the University of Minnesota Medical School, situated in Minneapolis. Minneapolis and St. Paul are practically one city, and have a combined population of 516,162.

Minneapolis

University of Minnesota Medical School.—Organized in 1883; reorganized in 1888 by absorption of St. Paul Medical College and Minnesota Hospital Medical College. The first class graduated in 1889. In 1908 the Minneapolis College of Physicians and Surgeons, organized in 1883, was merged. In 1909 the Homeopathic College of Medicine and Surgery was merged. The faculty includes 10 professors and clinical professors and 76 associate professors, assistants, etc., a total of 86. The curriculum covers four years of nine months each and a year's internship in an approved hospital. The entrance requirements are two years of university work which must include one year each of physics, general chemistry, qualitative analysis, zoology or botany, and French or German, all in addition to a four-year high-school course, including two years of Latin. Students entering hereafter will be required to secure a degree of B.S. or A.B. before the M.D. is granted. Total fees are $150 each year. The Dean is Dr. E. P. Lyon. The total registration for 1912-13 was 176; graduates, 45. The twenty-sixth session begins Sept. 17, 1913, and ends June 11, 1914.

MISSISSIPPI

Mississippi, population 1,797,114, has one medical college, the Medical Department of the University of Mississippi, which is located at Oxford, a city of 1,825 inhabitants.

Oxford

University of Mississippi Medical Department.—Organized in 1903. Gives only the first two years of the medical course. The session extends over eight and a half months. The total fees each year are respectively $102 and $100. The faculty numbers 13. The Dean is Dr. W. S. Leathers. The total registration for 1912-13 was 38. The eleventh session begins Sept. 18, 1913, and ends June 2, 1914.

MISSOURI

Missouri, population 3,293,335, has eight medical colleges. St. Louis, population 687,029, contains five of these, viz., the School of Medicine of St. Louis University, Washington University Medical Department, St. Louis College of Physicians and Surgeons and the American Medical College. Kansas City, which with Kansas City, Kan., has a total population of 330,662, has two colleges, namely: the Kansas City Hahnemann Medical College and the Eclectic Medical University. Ensworth Medical College is located in St. Joseph, population 77,403. The Department of Medicine of the University of Missouri is at Columbia, a town of 9,662 people.

Columbia

University of Missouri School of Medicine.—Organized at St. Louis in 1845; was discontinued in 1859, but was reorganized at Columbia in 1872. Teaching of the clinical years was suspended in 1909. The faculty includes 9 professors and 6 assistant professors, lecturers, etc., a total of 15. The course covers two years of nine months each. The entrance requirements are two years of college work including English, 5 hours; German, 5 hours; general zoology, 5 hours; physics, 5 hours; inorganic chemistry, 5 hours; elective, 35 hours. Equivalent work in foreign language may be substituted for the English and German. Total fees are $60 each year. Total registration of students for 1912-13 was 45. The next session begins Sept. 18, 1913, and ends June 4, 1914.

Kansas City

Kansas City Hahnemann Medical College, 916 Tracy Avenue.—Organized in 1888 as the *Kansas City Homeopathic Medical College.* The first class graduated in 1899. In 1902 it united with the Hahnemann Medical College of the Kansas City University, taking the present title. The Dean is Dr. Moses T. Runnels. Total registration for 1912-13 was 55; graduates, 8. The next session begins Sept. 18, 1913, and ends May 21, 1914.

Eclectic Medical University, 1423 Independence Avenue.—Organized at Kansas City, Mo., in 1898 with the present title. Moved to Kansas City, Kan., in 1907, and took the name of Western Eclectic College of Medicine and Surgery. Returned to Kansas City, Mo., in 1909 and resumed the present title. First class graduated in 1900. Fees are $100 each year. The Secretary is Dr. D. R. Alexander. The total registration for 1912-13 was 50; graduates, 13. *Reported not in good standing by the Missouri State Board of Health and by twenty other state licensing boards.*

St. Joseph

The Ensworth Medical College, Seventh and Jule Streets.—Organized in 1876 as the St. Joseph Hospital Medical College. In 1882 it merged with the College of Physicians and Surgeons to form the St. Joseph Medical College. In 1888 changed name to Ensworth Medical College. In 1905 merged with the Central Medical College, organized in 1894, to form the Ensworth-Central

Medical College. In 1907 the present title was resumed. Will close in 1914. The faculty numbers 34. Only seniors will be registered. Fees, $125. The Secretary is Dr. T. E. Potter. Total registration for 1912-13 was 20; graduates, 7. The next session begins Sept. 20, 1913, and ends about May 20, 1914.

St. Louis

Washington University Medical School, 1806 Locust Street. Organized in 1842 as the Medical Department of St. Louis University. In 1855 it was chartered as an independent institution under the name of St. Louis Medical College. The first class graduated in 1843. In 1891 it became the Washington University Medical School. In 1899 it absorbed the Missouri Medical College. The faculty comprises 23 professors and 51 lecturers, instructors, etc., a total of 74. Two full years of college work are required for admission including courses in English, physics, chemistry and biology and a reading knowledge of German. The course is four years of eight months each. The total fees for the four years are, respectively, $155, $150, $150 and $155. The Dean is Dr. Eugene L. Opie. The total registration for 1912-13 was 66; graduates, 28. The next session begins Sept. 25, 1913, and ends June 11, 1914.

St. Louis University School of Medicine, 1402 South Grand Avenue.—Organized in 1901 by union of Marion-Sims Medical College, organized in 1890, and Beaumont Hospital Medical College, organized in 1886. It became the Medical Department of St. Louis University in 1903. The faculty is composed of 43 professors, 67 lecturers and assistants, a total of 110. One year of college subjects preliminary to the four years of medical subjects is given in the medical school. The curriculum covers four years of thirty-four weeks each. The total fees are $130 each year. The total registration for 1912-13 was 233; graduates, 69. The next session begins Oct. 1, 1913, and ends June 7, 1914.

St. Louis College of Physicians and Surgeons, Jefferson Avenue and Gamble Street.—Organized in 1869. Classes graduated in 1870 and each subsequent year until 1873, when it suspended. It was reorganized in 1879. Classes graduated in 1880 and subsequent years. The fees for the four years are, respectively, $110, $105, $100 and $95. The Secretary is Dr. E. T. Brand. Total registration for 1912-13 was 38; graduates, 10. The next session begins Sept. 15, 1913, and ends May 17, 1914.

American Medical College, 407 South Jefferson Avenue.—Organized in 1873 as an Eclectic College. Eclecticism dropped in 1910. Absorbed the Barnes Medical College in 1911. Became the Medical Department of the National University of Arts and Sciences in 1912. Two classes were graduated each year from 1874 to 1883, inclusive. Since then one class has graduated each year. The course covers four years of eight and a half months each. Fees: matriculation, $5; tuition each year, $135. The Dean is Dr. James Moores Ball. The total registration for 1912-13 was 211; graduates, 33. The next session begins Sept. 23, 1913, and ends June 6, 1914.

NEBRASKA

Nebraska, population 1,192,214, has three medical colleges. The University of Nebraska College of Medicine and the John A. Creighton Medical College of Omaha, population 124,096, and the Cotner Medical College at Lincoln, population 43,973.

Bethany-Lincoln

Cotner Medical College. Eclectic. University Campus, Bethany, and corner 13th and P Streets, Lincoln. It is the Medical Department of Cotner University.—Organized in 1890 as the Lincoln Medical College. Assumed present title in 1911. The first class graduated in 1891. The Registrar is Prof. R. L. Hoff, Bethany. The total registration for 1912-13 was 35; graduates, 7. The next session begins Sept. 15, 1913, and ends May 28, 1914.

Omaha

John A. Creighton Medical College, Fourteenth and Davenport Streets. It is the Medical Department of Creighton University.—Organized in 1892. The first class graduated in 1895. It has a faculty of 18 professors and 30 associates, lecturers and assistants, a total of 48. The course of study embraces four years of eight months each. The total fees for the four years, respectively, are $140, $130, $130 and $130. The Dean is Dr. A. L. Muirhead. Total registration for 1912-13 was 182; graduates, 39. The twenty-second session begins Sept. 1, 1913, and ends April 30, 1914.

College of Medicine University of Nebraska, Forty-second Street and Dewey Avenue.—Organized in 1881 as the Omaha Medical College. The first class graduated in 1882. It became the Medical Department of Omaha University in 1891. In 1902 it affiliated with the University of Nebraska, with the present title. The first two years were given at Lincoln and the last two in Omaha until 1913 when all four years were transferred to Omaha. The faculty is composed of 31 professors and 27 lecturers and instructors, total 58. Two years of collegiate work are required for admission including courses in physics, chemistry, zoology and German. The fees are approximately $100 per annum. The Acting-Dean is Dr. Robert H. Wolcott. Total registration for 1912-13 was 78; graduates, 9. The next session begins Sept. 9, 1913, and ends May 29, 1914.

NEW HAMPSHIRE

New Hampshire, population 443,140, has one medical college, located at Hanover, population 1,884.

Hanover

Dartmouth Medical School.—Organized as New Hampshire Medical Institute in 1797. The first class graduated in 1798. It is the Medical Department of Dartmouth College. The faculty is made up of 25 professors and 3 instructors, a total of 28. Two years of collegiate work are required for admission. The course covers four years of eight months each. After the class of 1914 has graduated the school will discontinue clinical teaching. The fees for the four years are, respectively, $160, $162, $125 and $125. The Dean is Dr. John M. Gile. The total registration for 1912-13 was 27; graduates, 10. The work of the first and second years begins with that of the academic department Sept. 19, 1913, and ends June 21, 1914; for the advanced classes the course begins Aug. 5, 1913, and ends April 24, 1914.

NEW YORK

New York State, population 9,113,614, has ten medical colleges. Seven of these, College of Physicians and Surgeons (Columbia University), Long Island College Hospital, New York Homeopathic Medical College and Hospital, New York Medical College and Hospital for Women, Cornell University Medical College, the University and Bellevue Hospital Medical College and Fordham University School of Medicine, are located in New York City, population 4,766,883. Albany Medical College is located in Albany, a city of 100,253 people. The University of Buffalo Medical Department is situated in Buffalo, population 423,715. The College of Medicine, Syracuse University, is in Syracuse, a city of 137.249 inhabitants.

Albany

Albany Medical College, Lancaster and Jay Streets.—Organized in 1838. The first class graduated in 1839. It became the Medical Department of Union University in 1873. The faculty is composed of 28 professors and 75 lecturers, assistants, etc., a total of 103. The curriculum covers four years of eight months each. Fees: First year, $130; second year, $145; third year, $120, and fourth year, $130. The Registrar is Dr. Willis G. Tucker. The total registration for 1912-13 was 239; graduates, 48. The eighty-third session begins Sept. 23, 1913, and ends May 26, 1914.

Buffalo

University of Buffalo Medical Department, High Street, near Main.—Organized in 1846. The first class graduated in 1874. It absorbed the Medical Department of Niagara University in 1898. The faculty is composed of 34 professors and 56 lecturers, assistants, etc., a total of 90. The course covers four years of eight months each. The total fees for the four years, respectively, are $185, $180, $140 and $140. The Dean is Dr. Herbert U. Williams. Total registration for 1912-13 was 221; graduates, 43. The sixty-eighth session begins Sept. 22, 1913, and ends June 5, 1914.

New York

Columbia University College of Physicians and Surgeons, 437 West Fifty-Ninth Street.—Organized in 1807 by the regents of the University of the State of New York as their medical department. The first class graduated in 1811. Affiliated with Columbia College in 1814 and was permanently connected in 1860, when it became the Medical Department of Columbia College. That institution became Columbia University in 1891. The faculty is composed of 67 professors and 138 instructors, demonstrators, etc., a total of 205. Two years of collegiate work, including courses in physics, chemistry and biology, are required for admission. The work covers four years of eight months each. The Dean is Dr. Samuel W. Lambert. The total fees for the first year are $255; for the second and third, $250, and $275 for the fourth year. Total registration for 1912-13 was 339; graduates, 99. The 106th session begins Sept. 24, 1913, and ends June 3, 1914.

Cornell University Medical College, First Avenue and Twenty-Eighth Street, New York City, and Ithaca.—Organized in 1898. The first class was graduated in 1899. The work of the first year may be taken either in Ithaca or New York. The faculty is composed of 50 professors and 95 assistants, lecturers, instructors, etc., a total of 145. All candidates for admission must be graduates of approved colleges or scientific schools or seniors of approved colleges which will permit them to substitute the first year of this medical school for the fourth year of their college course and will confer on them the Bachelor degree on the completion of the year's work. The candidate must also have such knowledge of physics, inorganic chemistry and biology as may be obtained in college by a year's course in these subjects when accompanied by laboratory work. Fees: First and fourth years, $190 each; second and third, $185 each. The Dean is Dr. William M. Polk. Total registration for 1912-13 was 102; graduates, 19. The sixteenth session begins Oct. 1, 1913, and ends June 11, 1914

Fordham University School of Medicine, Third and Pelham Avenues.—Organized in 1905. First class graduated in 1909. The faculty consists of 49 professors and 44 lecturers and assistants, a total of 93. The course of instruction covers four years of eight and a half months each. Fees, $200 each year. A year's work in a recognized college of liberal arts is required for admission. The Dean is Dr. William P. Healy. The total registration for 1912-13 was 136; graduates, 31. The ninth session begins Sept. 26, 1913. and ends June 10, 1914.

Long Island College Hospital, Henry Street, near Atlantic Avenue, Brooklyn.—Organized in 1858. The first class graduated in 1860. It has a faculty of 37 professors and 44 assistants, instructors, etc., a total of 81. The course covers four years of eight months each. Fees: First year, $205; second year, $200; third, $180, and $200 for the fourth year. The Secretary is Dr. Joseph H. Raymond. Total registration 1912-13 was 438; graduates, 69. The fifty-sixth session begins Sept. 23, 1913, and ends June 1, 1914.

New York Homeopathic Medical College and Flower Hospital, Eastern Boulevard, between Sixty-Third and Sixty-Fourth Streets.—Organized in 1858. Incorporated in 1860 as the Homeopathic Medical College for the State of New York. The present title was assumed in 1869. The first class graduated in 1861. The faculty consists of 43 professors and 42 assistants, lecturers, etc., a total of 85. The Dean is Dr. Royal S. Copeland. Total registration for 1912-13 was 245; graduates, 45. The fifty-fourth session begins Oct. 1, 1913, and ends May 29, 1914.

New York Medical College and Hospital for Women, (Homeopathic) 17-19 West One Hundred and First Street.—Organized in 1863. The first class graduated in 1864. The faculty consists of 30 professors and 20 lecturers and assistants, a total of 50. The course covers four years of thirty weeks each. The fees for each of the four years, respectively, are $155, $150, $135 and $155. The Dean is Dr. Emily C. Charles. The total registration for 1912-13 was 45; graduates, 9. Matriculants are not listed in the annual announcement. The fifty-first session begins Sept. 30, 1913, and ends May 24, 1914.

University and Bellevue Hospital Medical College, First Avenue and Twenty-Sixth Street.—Organized in 1898 by the union of the New York University Medical College, organized in 1841, and the Bellevue Hospital Medical College, organized in 1861. It is the Medical Department of New York University. The faculty is composed of 44 professors and 135 instructors, etc., in all 179. The course covers four years of eight months each. The fees are $200 per year; graduation fee, $25. The Dean is Dr. Egbert Le Fevre. Total registration for 1912-13 was 352; graduates, 75. The next session begins Sept. 24, 1913, and ends June 10, 1914.

Syracuse

Syracuse University College of Medicine, 307-311 Orange Street.—Organized in 1872, when the Geneva Medical College was removed to Syracuse, under the title "The College of Physicians and Surgeons of Syracuse University." Present title assumed in 1875. The first class graduated in 1873 and a class graduated each subsequent year. In 1884 the amalgamation with the university was made complete. Two years of a recognized college course are required for admission. The course covers four years of thirty-two weeks each. The total fees for each of the four years are respectively, $186, $186, $146 and $161. The faculty is composed of 23 professors and 48 associate and assistant professors, lecturers and instructors. The Dean is Dr. John L. Heffron. The total enrollment for 1912-13 was 87; graduates, 21. The forty-second session begins Sept. 30, 1913, and ends June 10, 1914.

NORTH CAROLINA

North Carolina, population 2,206,287, has four medical schools, two of which give only the first two years of the medical course. The Medical Department of the University of North Carolina is located at Chapel Hill, population 1,200. The Leonard School of Medicine is at Raleigh, population 19,218. The North Carolina College is at Charlotte, population 34,014. Wake Forest School of Medicine is at Wake Forest, population 823.

Chapel Hill

University of North Carolina Medical Department.—Organized in 1890. Until 1902 this school gave only the work of the first two years, when the course was extended to four years by the establishment of a department at Raleigh. The first class graduated in 1903. A class was graduated each subsequent year, including 1910, when the clinical department at Raleigh was discontinued. The faculty is composed of 12 professors and 17 lecturers, assistants, etc., a total of 29. The total fees for the two years, respectively, are $115 and $116. The Dean is Dr. I. H. Manning. The total registration for 1912-13 was 54. The twenty-eighth session begins Sept. 8, 1913, and ends June 3, 1914.

Charlotte

North Carolina Medical College, Church and Sixth Streets.—Organized in 1887 at Davidson as the Davidson School of Medicine. It was a preparatory school only, not granting any degrees until 1903, when it was chartered under its present name. The first class was graduated in 1893. Removed to Charlotte in 1907. The faculty numbers 42. The course covers four years of eight months each. The fees for the four years are, respectively, $107, $102, $100 and $130. The Dean is Dr. Walter O. Nisbet. The total registration for 1912-13 was 85; graduates, 26. The next session begins Oct. 1, 1913, and ends June 1, 1914.

Raleigh

Leonard Medical School.—Colored. This department of Shaw University was established in 1882. Classes were graduated in 1886, 1888 and in all subsequent years. It has a faculty of 14. The course covers four years of seven and a half months each. The total fees for each year are $57; graduation fee, $10. The President is Charles F. Meserou. Total registration for 1912-13 was 97; graduates, 22. The thirty-second session begins Oct. 1, 1913, and ends May 14, 1914.

Wake Forest

Wake Forest College School of Medicine.—This school was organized in 1902. The faculty, including the professors of chemistry, physics, and biology, numbers 9 exclusive of laboratory asistants. Only the first two years of the medical course are offered after the completion of freshmen and sophomore college work, and on this combined course the B.S. degree is conferred. Each annual course extends over nine months. The fees for each year aggregate $102.50. The Secretary is E. B. Earnshaw. The total registration for 1912-13 was 30. The twelfth session begins Sept. 2, 1913, and ends May 22, 1914.

NORTH DAKOTA

North Dakota, population 577,056, has one medical college, the College of Medicine of the State University of North Dakota, which is situated at University, near Grand Forks, a city of 12,478 people. It gives only the first two years of the medical course.

University

University of North Dakota College of Medicine.—Organized in 1905. The faculty is composed of 5 professors and 5 instructors, a total of 10. The course consists of two years' academic work and two years of medical college subjects, occupying nine months each year. The total fees for each of the medical years are $50. The Dean is Dr. H. E. French. The total registration for 1912-13 was 14. The ninth session begins Sept. 23, 1913, and ends June 17, 1914.

OHIO

Ohio, population 4,767,121, has six medical colleges. Two of these, the Ohio-Miami Medical College of the University of Cincinnati and the Eclectic Medical College, are located in Cincinnati, a city of 364,463 inhabitants. Cleveland, population 560,663, contains two medical schools: Western Reserve Medical College and the Cleveland-Pulte Medical College. Columbus, population 181,548, contains one medical college, the Starling-Ohio Medical College. Toledo, with 168,497 people, has one medical school, the Toledo Medical College.

Cincinnati

The Ohio-Miami Medical College of the University of Cincinnati, Clifton Avenue, west of Vine Street.—Organized in 1909 by the union of the Ohio Medical College (founded in 1819) with the Miami Medical College (founded in 1852). The Ohio Medical College became the Medical Department of the University of Cincinnati, April 26, 1896. Under a similar agreement, March 2, 1909, the Miami Medical College also merged into the University, when the present title was taken. The faculty consists of 37 professors, 87 associates, assistants, etc., a total of 124. Two years of college work are required for admission. The course covers four years of eight months each. The fees are a tuition fee of $150 a year; a matriculation fee of $5, payable but once, and a graduation fee of $25. The Dean is Dr. Paul G. Woolley. The total registration for 1912-13 was 80; graduates, 26. The next session begins Oct. 1, 1913, and ends June 13, 1914.

Eclectic Medical College, 630 West Sixth Street.—Organized in 1833 at Worthington as the Worthington Medical College. Removed to Cincinnati in 1843. In 1845 it was chartered as the Eclectic Medical Institute. In 1857 the American Medical College, organized in 1839, was merged into it, and in 1859 the Eclectic College of Medicine and Surgery, organized in 1856, merged into it. In 1910 it assumed its present title. Classes were graduated in 1833 and in all subsequent years except 1839 to 1843, inclusive. It has a faculty of 17 professors and 18 lecturers and assistants, a total of 35. The course covers four years of eight months each. The fees are $100 for each year. The Dean is Dr. R. L. Thomas. Total registration for 1912-13 was 92; graduates, 26. The next session begins Sept. 11, 1913, and ends May 11, 1914.

Cleveland

Cleveland-Pulte Medical College, Prospect Avenue and Huron [illegible] Organized in 1849 as the Western College [illegible] The first class graduated in 1853. In [illegible] ern Homeopathic College and in 1870 it became the Homeopathic Hospital College when the Homeopathic Medical College for Women, organized in 1868, merged into it. In 1894 it became the Cleveland University of Medicine and Surgery. In 1898 it merged with the Cleveland Medical College, organized in 1890, and assumed the title of Cleveland Homeopathic Medical College. In 1910 Pulte Medical College of Cincinnati merged into it and the present title was assumed. The faculty numbers 53. The fees are $125 each year. The Dean is Dr. George H. Quay. Total registration for 1912-13 was 85; graduates, 23. The next session begins Oct. 1, 1913, and ends June 12, 1914.

Western Reserve University School of Medicine, St. Clair Avenue and East Ninth Street.—Organized in 1843 as the Cleveland Medical College. The first class graduated in 1844. It assumed the present title in 1881. In 1910 it absorbed the Cleveland College of Physicians and Surgeons. The faculty includes 41 professors and 55 lecturers, assistants, etc., a total of 96. The curriculum embraces four years of eight and one-half months each. Three years of college work are required for admission. The total fees for the first year are $162 and $155 each for the other three years. The Secretary is Dr. F. C. Waite. The total registration for 1912-13 was 161; graduates, 38. The seventy-first session begins Oct. 2, 1913, and ends June 18, 1914.

Columbus

Starling-Ohio Medical College, Buttles Avenue and Park Street.—Organized in 1907 by the union of Starling Medical College (organized 1834) with the Ohio Medical University (organized 1890). The faculty consist of 27 professors and 37 lecturers, demonstrators, etc., a total of 64. The course covers four years of eight months each. Matriculation, $5; tuition $150 each year. The Dean is Dr. W. J. Means. The total registration for 1912-13 was 263; graduates, 53. The next session begins Sept. 24, 1913, and ends May 27, 1914.

Toledo

Toledo Medical College, Cherry and Page Streets.—Organized in 1883. The first class graduated in 1883. The faculty numbers 50. The curriculum embraces four years of eight months each. The fees for each of the four years are, respectively, $137, $132, $125 and $125. The Dean is Dr. L. A. Brewer. The total registration for 1912-13 was 32; graduates, 15. The next session begins Oct. 1, 1913, and ends May 31, 1914.

OKLAHOMA

Oklahoma, population 1,657,155, has one medical college, the School of Medicine of the State University of Oklahoma. The work of the first and second years is given in the academic laboratories at Norman, a city of 3,040 inhabitants. The work of the third and fourth years is given in Oklahoma City, which has a population of 64,205 and which is eighteen miles north of Norman.

Norman and Oklahoma City

State University of Oklahoma School of Medicine.—Organized in 1900. Gave only the first two years of the medical course until 1910, when a clinical department was established at Oklahoma City. It has a faculty of 9 professors and 27 instructors, a total of 36. The course is four years of nine months each. An optional course of six years is offered for the degrees of B.S., and M.D. The total fees for the four years are, respectively, $55, $28, $100 and $105. The Dean is Dr. W. J. Jolly, 317 East Fourteenth Street, Oklahoma City. The total registration for 1912-13 was 32; graduates, 9. The fourteenth session begins Sept. 25, 1913, and ends June 11, 1914.

OREGON

Oregon, population 672,765, has one medical college, the University of Oregon Medical Department located in Portland, a city of 207,214 population.

Portland

University of Oregon Medical Department, Lovejoy and Twenty-Third Streets.—Organized in 1887. The first class graduated in 1888. The Willamette University Medical Department was merged in 1913. It has a faculty of 18 professors and 35 lecturers, assistants, etc., a total of 53. Entrance requirements are one year of college work or its equivalent. The course is four years of eight months each. Fees: Matriculation $5; tuition $150 each year. The Dean is Dr. K. A. J. Mackenzie. The total registration for 1912-13 was 57; graduates, 19. The twenty-seventh session begins Oct. 1, 1913, and ends June 1, 1914.

PENNSYLVANIA

Pennsylvania, population 7,665,111, has seven medical colleges. Of these Philadelphia, having a population of 1,549,008, contains six, as follows: University of Pennsylvania Department of Medicine, Jefferson Medical College, Hahnemann Medical College, Woman's Medical College of Pennsylvania, Medico-Chirurgical College of Philadelphia and Temple University Department of Medicine. The other school, the Medical Department of the University of Pittsburgh, is situated in Pittsburgh, a city of 533,905

Philadelphia

University of Pennsylvania Department of Medicine, Thirty-Sixth Street and Hamilton Walk.—Organized in 1765. Classes were graduated in 1768 and in all subsequent years except 1772-79, inclusive. The original title was the Department of Medicine, College of Philadelphia, which was changed to the present title in 1791. It granted the first medical diploma issued in America. The faculty is made up of 30 professors, 17 associate, adjunct and assistant professors and 126 demonstrators, lecturers, associates, instructors, etc., a total of 173. The requirements for admission are the equivalent of work prescribed for the first two years in recognized colleges, which work must include a knowledge of physics, chemistry and general biology or zoology and two foreign languages, one of which must be French or German. The course embraces study of four years of thirty-four weeks each. The total fees for each of the four years are, respectively, $229.50, $211.50, $210 and $211.50. The Dean is Dr. William Pepper. Total registration for 1912-13 was 307; graduates, 100. The next session begins Sept. 26, 1913, and ends June 17, 1914.

Jefferson Medical College, Tenth and Walnut Streets.—Organized in 1825 as the Medical Department of Jefferson College, Cannonsburg. The first class graduated in 1826. The present title was assumed in 1838. It has a faculty of 24 professors and 132 lecturers, demonstrators, etc., a total of 156. The course of study covers graded work of four years of eight and a half months each. An optional fifth year is offered. The tuition is $180 a year, with a matriculation fee of $5, paid but once. The Subdean is Dr. Ross V. Patterson. The total registration for 1912-13 was 680; graduates, 126. The eighty-ninth session begins Sept. 24, 1913, and ends June 6, 1914.

Medico-Chirurgical College of Philadelphia, Cherry Street, between Seventeenth and Eighteenth Streets.—Organized in 1881. The first class graduated in 1882. The faculty is composed of 42 professors and 70 lecturers, assistants, etc., a total of 112. The work embraces four years of eight months each. The fees for each of the four years are, respectively, $162.50, $159, $155.50 and $153. The Dean is Dr. Seneca Egbert. The total registration for 1912-13 was 314; graduates, 64. The thirty-third session begins Sept. 22, 1913, and ends June 5, 1914.

Woman's Medical College of Pennsylvania, Twenty-First and N. College Avenue.—Organized in 1850. Classes were graduated in 1851 and in all subsequent years except 1861 and 1862. It has a faculty of 11 professors and 49 assistants, lecturers, etc., in all 60. The curriculum covers four years of eight months each. Fees for each of the four years are, respectively, $161, $156, $154 and $153. The Dean is Dr. Clara Marshall. The total registration for 1912-13 was 93; graduates, 24. The sixty-fourth session begins Sept. 17, 1913, and ends June 3, 1914.

Hahnemann Medical College and Hospital, 226 North Broad Street.—Organized in 1848 as the Homeopathic Medical College of Pennsylvania. In 1869 it united with the Hahnemann Medical College of Philadelphia, taking the present title. The first class graduated in 1849. It has a faculty of 31 professors and 57 lecturers, instructors, etc., in all 88. The work covers four years of eight and a half months each. Fees: For each year, $180; matriculation, $5; laboratory fee, $10. The Dean is Dr. William B. Van Lennen. The total registration for the college year 1912-13 was 92; graduates, 31. The sixty-sixth session begins Sept. 22, 1913, and ends June 4, 1914.

The Temple University Department of Medicine, Eighteenth and Buttonwood Streets.—Organized in 1901. The first class graduated in 1904. The faculty numbers 97. It gives a four-year day course. The fees are $150 per year. The Dean is Dr. Frank C. Hammond. The total registration for 1912-13 was 69; graduates, 13. The thirteenth session begins Sept. 18, 1913, and ends June 6, 1914.

Pittsburgh

University of Pittsburgh School of Medicine, Grant Boulevard.—Organized in 1886 as the Western Pennsylvania Medical College. Became the Medical Department of the University of Pittsburgh in 1908. Removed to the University campus in 1910. The first class graduated in 1887. The faculty is composed of 16 professors, and 82 associates, assistants, etc., 98 in all. Entrance requirements are for two years of recognized college work to have included essentially courses in chemistry (inorganic and organic), physics, biology and a modern language other than English, based on a four-year high school preparation. It is possible for students to get the degrees of B.S. and M.D. in six years. The course of study for medicine alone is four years of eight and a half months each. The tuition is $220 a year, $210 if paid in advance. The Dean is Dr. Thomas S. Arbuthnot. The total registration for 1912-13 was 153; graduates, 43. The twenty-eighth session begins Sept. 29, 1913, and ends June 17, 1914.

SOUTH CAROLINA

South Carolina, population 1,515,400, has one medical college, situated in Charleston, a city of 58,833 people.

Charleston

The Medical College of the State of South Carolina, Queen and Franklin Streets.—Founded in 1823 as the Medical College of South Carolina. In 1832 it was chartered with the present title. Classes were graduated in 1825 and in all subsequent years except 1861 to 1865, inclusive. In 1912 by legislative enactment became a state institution. It has a faculty of 10 professors and 34 lecturers, instructors, etc., a total of 44. The course covers four years of eight months each. The total fees each of the first three years are $100 and $75 for the fourth year. The Dean is Dr. Robert Wilson. Total enrolment for 1912-13 was 118; graduates, 30. The ninety-first session begins Oct. 1, 1913, and ends June 4, 1914.

SOUTH DAKOTA

South Dakota, population 583,888, has one medical college, the University of South Dakota College of Medicine, located at Vermilion, a city of 2,147 people.

Vermilion

University of South Dakota College of Medicine.—Organized in 1907. Offers only the first two years of the medical course Two years work in a college of liberal arts is required for admission. The fees are $60 each year. The faculty numbers 9. The Dean is Christian P. Lommen, B.S. The total registration for 1912-13 was 13. The seventh session begins Sept. 16, 1913, and ends June 11, 1914.

TENNESSEE

Tennessee, population 2,184,789, has five medical colleges. Of these Vanderbilt University Medical Department and Meharry Medical College are situated in Nashville, a city with a population of 106,476. Knoxville, population 37,758, contains one college, the Tennessee Medical College. The Medical Department of the University of Tennessee and the University of West Tennessee are located in Memphis, population 136,363.

Knoxville

Medical Department of Lincoln Memorial University, Cleveland Street and Dameron Avenue.—Organized in 1889 as the Tennessee Medical College. Affiliated with the Lincoln Memorial University since 1906, assumed present title and became an integral part of the university in 1909. The first class graduated in 1890. It has a faculty of 26 professors and 10 assistants, a total of 36. The curriculum covers four years of seven months each. Fees: Tuition, each year, $100; matriculation fee, $5; graduation fee, $25. The Dean is Dr. Chas. P. McNabb. The total registration for 1912-13 was 98; graduates, 19. The twenty-fifth session begins Sept. 23, 1913, and ends May 20, 1914.

Memphis

University of Tennessee College of Medicine, three buildings, 879 Madison Avenue, 880 Monroe Avenue, and 718 Union Avenue.—Organized 1876 at Nashville as Nashville Medical College. Became Medical Department University of Tennessee 1879. First class graduated 1877 and a class graduated each subsequent year. In 1909 it united with the Medical Department of the University of Nashville to form the joint Medical Department of the Universities of Nashville and Tennessee. This union was dissolved in 1911. The Trustees of the University of Nashville by formal action of that Board named the University of Tennessee College of Medicine as its legal successor in medical teaching, transferring all of its college and hospital equipment to the successor. This college then removed to Memphis, where it united with the College of Physicians and Surgeons. The Memphis Hospital Medical College was merged in 1913. The Dean is Dr. Hubert Thomas Brooks. Total registration in the combined schools in 1912-13 was 383; graduates, (Univ. of Tenn.) 37 and (M.H.M.C.) 87; total 124. The next session begins Sept. 22, 1913, and ends June 5, 1914.

Medical Department of the University of West Tennessee, Colored, 1190 South Phillips Place.—Organized in 1900. The first class graduated in 1904 and a class graduated each subsequent year. It has a faculty of 18. The course is four years of thirty weeks each. The fees are $55 per year; graduation $10 extra. The Dean is Dr. M. V. Lynk. Registration for 1912-13 was 45; graduates, 13. The fourteenth session begins Sept. 15, 1913, and ends May 1, 1914.

Nashville

Vanderbilt University Medical Department.—This school was founded in 1874. The first class graduated in 1875. The faculty consists of 25 professors and 40 lecturers, a total of 65. The course covers four years of nearly eight months each. The total fees for each of the first three years are $150, and for the fourth year, $175. The Secretary is Dr. L. E. Burch. The total registration for 1912-13 was 365; graduates, 71. The 40th session begins Sept. 18, 1913, and ends May 12, 1914.

Meharry Medical College. Colored. Maple and Chestnut Streets.—This school was organized in 1876 and is the Medical Department of Walden University. The faculty is made up of 13 professors and 15 instructors, demonstrators, etc., 28 in all. The work embraces four years of thirty weeks each. The total fees for each of the first three years are $60 and for the fourth year, $75. The Dean is Dr. G. W. Hubbard. Total registration for 1912-13 was 322; graduates, 88. The 38th session begins Sept. 10, 1913, and ends April 21, 1914.

TEXAS

Texas, population 3,096,542 has four medical colleges. The University of Texas Department of Medicine is located at Galveston, a city of 36,981 inhabitants. The Fort Worth School of Medicine is at Forth Worth, population 73,312. The Baylor University College of Medicone and the Southern Methodist University Medical College are situated in Dallas, population 92,104.

Dallas

Baylor University College of Medicine, 435-37 South Ervay Street.—Organized in 1900 as the University of Dallas Medical Department. In 1903 it took its present name and became the Medical Department of Baylor University at Waco. It acquired the charter of Dallas Medical College in 1904. The first class graduated in 1901. The faculty numbers 47. Entrance requirement is one year of college work in addition to a four-year high school education. The course is four years of seven months each. The fees are $110 each year; matriculation fee of $5, paid but once, graduation fee, $15. The Dean is Dr. E. H. Cary. Total registration for 1912-13 was 91; graduates, 21. The 14th session begins Sept. 29, 1913, and ends May 28, 1914.

Southern Methodist University Medical College.—Organized in 1903 as the Southwestern University Medical College. Name changed as above in 1912. The first class graduated in 1904. It has a faculty of 33 professors and 4 instructors, assistants, etc., a total of 37. The course of instruction covers four years of eight months each. The fees for the four years are, respectively, $110, $105, $100 and $125. The Dean is Dr. John O. McReynolds. Total registration for 1912-13 was 65; graduates, 14. The tenth session begins Oct. 1, 1913, and ends May 29, 1914.

Fort Worth School of Medicine, Calhoun and Fifth Streets.—Organized in 1894 as the Medical Department of Fort Worth University. In 1912 the latter institution changed its name to Texas Christian University. The first class graduated in 1895. Present title in 1911. It has a faculty of 13 professors and 46 lecturers, assistants, etc., in all 59. The course covers four years of seven and a half months each. The total fees for each of the four years, respectively, are $114, $113, $108 and $125. The Dean is Dr. I. C. Chase. The total registration for 1912-13 was 60; graduates, 12. The 20th session begins Sept. 8, 1913, and ends June 4, 1914.

Galveston

University of Texas Department of Medicine, on the Strand, between Ninth and Tenth Streets.—Organized in 1891. The first class graduated in 1892. It has a faculty of 17 professors and 10 lecturers, a total of 27. The curriculum embraces four years of eight months each. The entrance requirement is one year of collegiate work in addition to a four-year high school education. The total fees for the four years, respectively, are $61, $31, $21 and $6. The Dean is Dr. William S. Carter. Total registration for 1912-13 was 153; graduates, 43. The 23d session begins Oct. 1, 1913, and ends May 30, 1914.

UTAH

Utah, population 373,351, has one medical college, the Medical Department of the University of Utah, situated at Salt Lake City, which has 92,777 people.

Salt Lake City

University of Utah School of Medicine.—Organized in 1900. Gives only first two years of the medical course. Each course covers thirty-six weeks. Two years of collegiate work are required for admission. The medical faculty consists of 9 professors and 5 lecturers and assistants, a total of 14. The fees are $55 each year. Total registration for 1912-13 was 16. The seventh session begins Sept. 15, 1913, and ends May 29, 1914.

VERMONT

Vermont, population 355,956, has one medical school, located at Burlington, a town of 20,468 people.

Burlington

University of Vermont College of Medicine, Pearl Street, College Park.—Organized with complete course in 1822. Classes graduated in 1823 to 1836, inclusive, when the school was suspended. It was reorganized in 1853 and classes were graduated in 1854 and in all subsequent years. The faculty numbers 48. One year of college work is required for admission. The course of study covers four years of nine months each. The total fees for each of the first three years are $140, and $165 for the fourth year. The Dean is Dr. H. C. Tinkham. The total registration for 1912-13 was 140; graduates, 37. The next session begins Sept. 24, 1913, and ends June 24, 1914.

VIRGINIA

Virginia, population 2,061,612, has two medical colleges, one, the Medical Department of the University of Virginia, situated in Charlottesville, population 6,765, and the Medical College of Virginia at Richmond, population 127,628.

Charlottesville

University of Virginia Department of Medicine.—Organized in 1827. Classes were graduated in 1828 and in all subsequent years except 1865. It has a faculty of 14 professors and 18 lecturers, instructors, assistants, etc., a total of 32. The requirements for admission are the completion of a four years' high school course, or its equivalent, and a year of college work devoted to chemistry, physics and biology. Total fees each year are $140. The Dean is Dr. R. H. Whitehead. The total registration for 1912-13 was 91, graduates, 14. The eighty-fifth session begins Sept. 11, 1913, and ends June 17, 1914.

Richmond

Medical College of Virginia, Marshall and College Streets.—Organized in 1838 as the Medical Department of Hampden Sydney College. Present title was taken in 1854. In 1913 the University College of Medicine was merged. Classes were graduated in 1840 and in all subsequent years. It has a faculty of 46 professors and 76 lecturers, instructors, etc., a total of 122. The requirement for admission is a full four-year high school education. The course embraces four years of eight months each. Fees, $164 each year; graduation fee, $30. The Dean is Dr. Christopher Tompkins. The total registration for the college year 1912-13 in the two colleges was 416; graduates, 83. The seventy-sixth session begins Sept. 16, 1913, and ends June 2, 1914.

WEST VIRGINIA

West Virginia, population 1,221,119, has one medical college, the School of Medicine of West Virginia University, which offers the first two years of the medical course. It is located at Morgantown, a city of 9,150 population.

Morgantown

West Virginia University School of Medicine.—Organized in 1902, and gives only the first two years of the medical course. One year of work in an approved college of liberal arts is required for admission. Sessions extend through nine months. The faculty numbers 9. Fees: For residents of the state, $25 each year; for non-residents, $50. The Dean is Dr. John N. Simpson. The total registration for 1912-13 was 8. The next session begins Sept. 15, 1913, and ends June 17, 1914.

WISCONSIN

Wisconsin, population 2,333,860, has two medical colleges, the Medical Department of the University of Wisconsin, which teaches the first two years of the medical course, and is located at Madison, a city of 25,531 people, and the Marquette University School of Medicine, located at Milwaukee, a city of 373,857 people.

Madison

University of Wisconsin College of Medicine.—Organized in 1907. Gives only the first two years of the medical course. For matriculation at least two years in a college of arts and science or an equivalent training are required, including two years of Latin, a reading knowledge of French and German, and at least a year's work in physics, chemistry and biology. It has a faculty of 14 professors and 10 lecturers, instructors, etc., a total of 24. Tuition fees: For residents of the state, $80 each year; for non-residents, $154. The Dean is Dr. Charles R. Bardeen. The registration for 1912-13 was 66. The sixth session begins Sept. 25, 1913, and ends June 17, 1914.

Milwaukee

Marquette University School of Medicine, Fourth Street and Reservoir Avenue.—Organized in December, 1912, by the merger of the Milwaukee Medical College and the Wisconsin College of Physicians and Surgeons. It has a faculty of 71 professors and 45 assistants, instructors, etc., a total of 116. Beginning this fall the entrance requirements include, in addition to a four-year high school education, one year of college work including courses in physics, chemistry, biology and a modern language. Beginning with the session of 1914-15, two years of college work will be required. The curriculum is for four years of thirty-four weeks each. The total fees for the four years, respectively, are $165, $160, $155 and $155. The Dean is Dr. Louis F. Jermain. The registration for 1912-13 was 283; graduates, 78. The second session begins Oct. 1, 1913, and ends June 18, 1914.

PHILIPPINE ISLANDS

The Philippine Archipelago, having a population of 7,635,436, has two medical colleges, the University of the Philippines College of Medicine and Surgery and the Medical Faculty of the University of St. Thomas. They are located in the city of Manila, which in 1903 had a population of 219,928.

Manila

UNIVERSITY OF THE PHILIPPINES COLLEGE OF MEDICINE AND SURGERY, Manila.—Organized in 1907 as the Philippine Medical School, under the support of the government of the Philippine Islands. Present title in 1910. The faculty numbers 53. In 1914 and thereafter two years of collegiate work leading to the degree of Bachelor of Arts will be required for admission. The course extends over five years of nine months each with an additional sixth year of intern service. The Dean is Dr. William E. Musgrave. The total registration for 1912-13 was 72; graduates, 8. The seventh session begins July 1, 1913, and ends April 2, 1914.

CANADA

The Dominion of Canada has eight medical colleges, all of which now require a four-year course, including in the first year courses in physics, chemistry and biology. This course is practically equal to that in the colleges of this country which require one year of college work for admission, including the science courses named. None of the Canadian colleges has a fixed minimum requirement of two years of collegiate work or its equivalent preliminary to or as a part of the medical course.

Manitoba

MANITOBA MEDICAL COLLEGE, Winnipeg.—It is the Medical Faculty of the University of Manitoba. Organized in 1883, first class graduated in 1886 and a class graduated each subsequent year. The faculty numbers 54. The fees are $155 for the first year and $150 for each subsequent year. The entire course covers five years, the first year including courses in physics, chemistry and biology. The Dean is Dr. H. H. Chown, 263 Broadway, Winnipeg. Total registration for 1912-13 was 154; graduates, 28. The next session begins Sept. 24, 1913, and ends May 1, 1914.

Nova Scotia

DALHOUSIE UNIVERSITY MEDICAL FACULTY, Halifax, N. S.—Organized in 1867. Incorporated as the Halifax Medical College in 1875. Reorganized as an examining faculty, separate from the Halifax Medical College in 1885. In 1911, in accordance with an agreement between the Governors of Dalhousie University and the Corporation of the Halifax Medical College, the work of the latter institution was discontinued and a full teaching faculty was established by the University. By an arrangement between Dalhousie University and the Provincial Medical Board of Nova Scotia, the final professional examinations are conducted conjointly by the University and the Board, and candidates may qualify at the same time for their academic degrees and the provincial license. First class graduated in 1872. It has a faculty of 28 professors, lecturers and demonstrators. Requires matriculation examination and a graded course of five years, including preliminary courses in physics, chemistry and biology. Fees are $100 each year. Total registration for 1912-13 was 78; graduates, 7. The Secretary is Dr. A. W. H. Lindsay, 319 Pleasant Street, Halifax, N. S. The next session begins Aug. 28, 1913, and ends April 30, 1914.

Ontario

UNIVERSITY OF TORONTO FACULTY OF MEDICINE, Toronto.—Organized 1843 as the Medical Faculty of King's College. *Abolished* in 1853. Reestablished in 1887. In 1903 it absorbed Trinity Medical College. The course of study covers five years of eight months each, the first year including courses in physics, chemistry and biology. It has a faculty of 46 professors and 107 lecturers, associates, etc., *a total* of 153. The fees are $150 each year. The Secretary is Dr. A. Primrose. The total registration for 1912-13 was 533; graduates, 85. The next session begins Sept. 30, 1913, and ends May 31, 1914.

MEDICAL FACULTY OF QUEEN'S UNIVERSITY, Kingston.—Organized 1854, first class graduated in 1855, and a class graduated each subsequent year. The faculty was originally a department of the University, but a separation took place in 1866, when the school was conducted under the charter of the Royal College of Physicians and Surgeons at Kingston. In 1892 the school again became an integral part of Queen's University. The faculty includes 25 professors and 14 assistants, instructors, etc., a total of 39. The fees amount to $105 each year; fee for M.D., C.M. degrees, $30. The course covers five years of seven months each, the first year including courses in physics, chemistry and biology. The total registration in 1912-13 was 251; graduates, 40. The Dean is Dr. J. C. Connell. The next session begins Sept. 15, 1913, and ends April 29, 1914.

MEDICAL DEPARTMENT OF WESTERN UNIVERSITY, London.—Organized in 1881, first class graduated in 1883 and a class graduated each year subsequently. The faculty numbers 30. The course is five years of seven and a half months each, the first year including courses in physics, chemistry and biology. The tuition is $100 each year. The Registrar is Dr. W. E. Waugh. Total registration for 1912-13 was 108; graduates, 27. The next session begins Sept. 17, 1913, and ends May 3, 1914.

Quebec

MEDICAL FACULTY OF McGILL UNIVERSITY.—Founded 1824 as Montreal Medical Institution; became the Medical Faculty of McGill University in 1829; first class graduated under the university auspices in 1833. No session between 1836-39 owing to political troubles. In 1905 it absorbed the Faculty of Medicine of the University of Bishop College. The course extends over five years of eight months each, including the preliminary year devoted to physics, chemistry and biology. The faculty numbers 119. The total fees are $150 for each of the first four years and $190 for the fifth. The total registration for 1912-13 was 365; graduates, 61. The Registrar is Dr. John W. Scane. The next session begins Oct. 1, 1913, and ends June 9, 1914.

LAVAL UNIVERSITY MEDICAL DEPARTMENT, Quebec.—The Quebec School of Medicine, organized in 1848, became in 1852 Medical Department of Laval University; first class graduated in 1855, and a class graduated each subsequent year. The faculty numbers 24. The fees are $60 each year. The course extends over five years, the first year including courses in physics, chemistry and biology. The Dean is Dr. Michael Joseph Ahren, Quebec. Total registration for 1912-13 was 66; graduates, 22. The next session begins Sept. 10, 1913, and ends June 1, 1914.

MONTREAL SCHOOL OF MEDICINE AND SURGERY, Montreal.—Organized in 1878 as the Medical Department of Laval University. Present name assumed in 1911. First class graduated in 1879. The faculty numbers 60. The course extends over five years. The Dean is Dr. E. P. Lachapelle. The total registration for 1912-13 was 180; graduates, 35. The next session begins Oct. 1, 1913, and ends June 20, 1914.

LIFE CHART OF MEDICAL COLLEGES

The chart shown on pages 578 to 581 shows by a series of vertical dark bands the years during which each of 308 medical colleges in the United States were in existence. Viewing the page as you open the book each of the horizontal lines represents the beginning of a year and figures for every fifth year from 1810 to 1910 are given at the right and left of each page. The five colleges organized prior to 1810 have their life lines prior to that date shown in a special section on page 580. To the right of the fourth page of the chart, figures are given following each year showing the number of colleges existing in that particular year. At the bottom of each page the name of each college is given opposite its vertical dark band and also the year it was organized and, if extinct, the year it was closed. A break in any dark band connected with a dotted line indicates that during that time the college was suspended. Such suspensions, as will be noted in the chart, were common among the medical schools of the South during the Civil War (1861-1865). Shaded lines indicate (a) that only the first two years of the medical course were offered; (b) that medical degrees were granted by the University as an examining body although no actual medical teaching was done; (c) that no degrees were granted; (d) that a preparatory course only was given; (e) that only the last two or clinical years were offered; (f) that degrees bearing the name of the university were granted for work done in another medical school, which also granted degrees; and (g) that the college was reported as not in good standing with its home state licensing board. The colleges have been so grouped as to bring together those which have been merged. The bands representing all such colleges are connected by pen lines. The grouping of the Kansas, Kentucky and Indiana colleges well illustrate this arrangement. Besides the 308 medical colleges included in this chart, there are 118 other institutions which are sometimes listed among medical schools. Among these colleges are some which apparently never held any sessions; others which had no graduates; others which, according to reports, were distinctly fraudulent or out-and-out diploma-mills; others were not legally chartered or otherwise were not recognized by their home licensing boards; others were apparently examining boards, and for others it is uncertain whether the students graduated were doctors or nurses. None of these institutions were deemed worthy of being included in the chart. A complete list[1] of these institutions follows:

IRREGULAR COLLEGES NOT INCLUDED IN CHART

ARKANSAS

Bethel Medical Department, Southwestern University, Little Rock.
Medical Department of Sulphur Rock College, Sulphur Rock.
Texas Health College, Hot Springs.*

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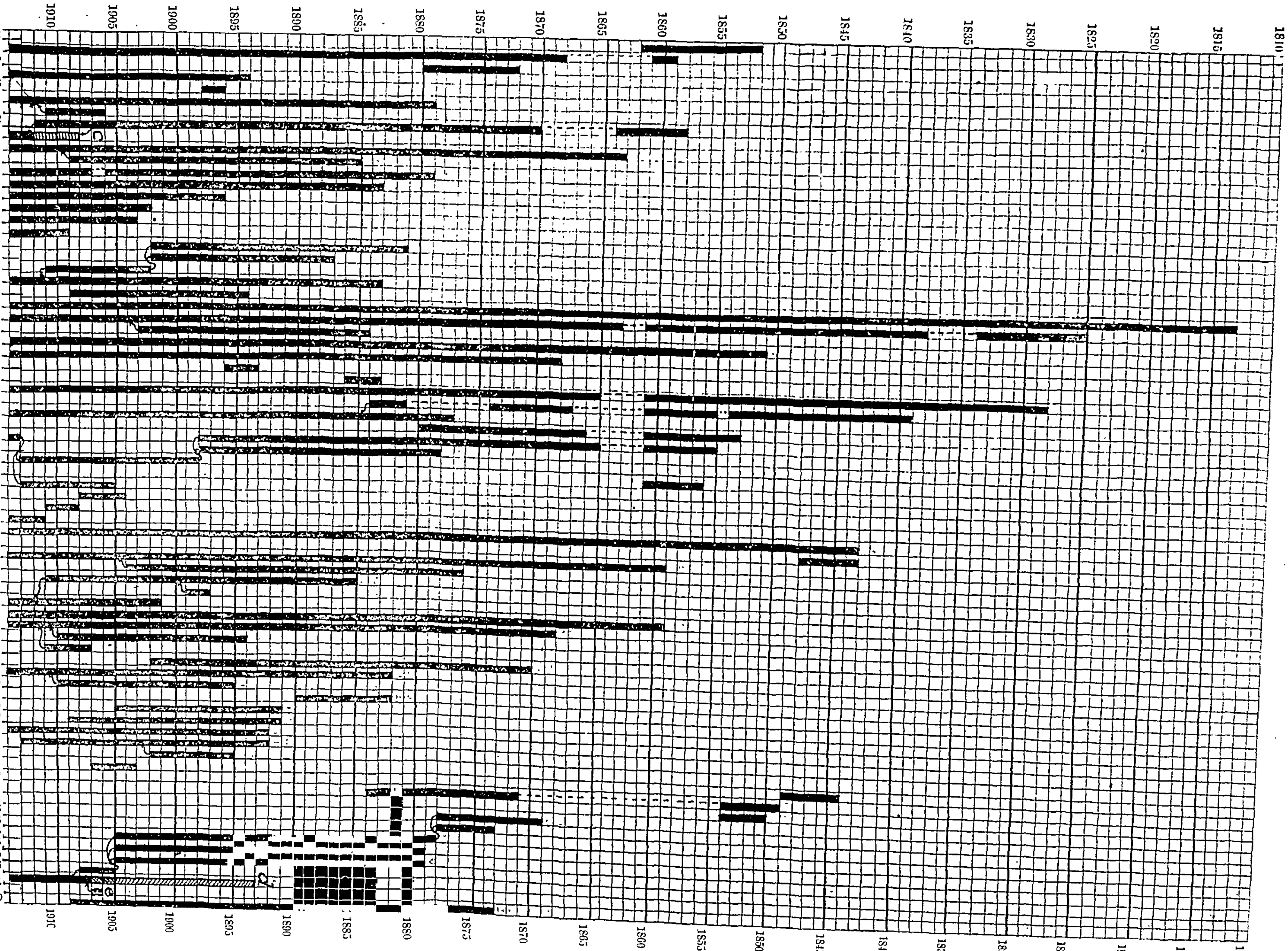
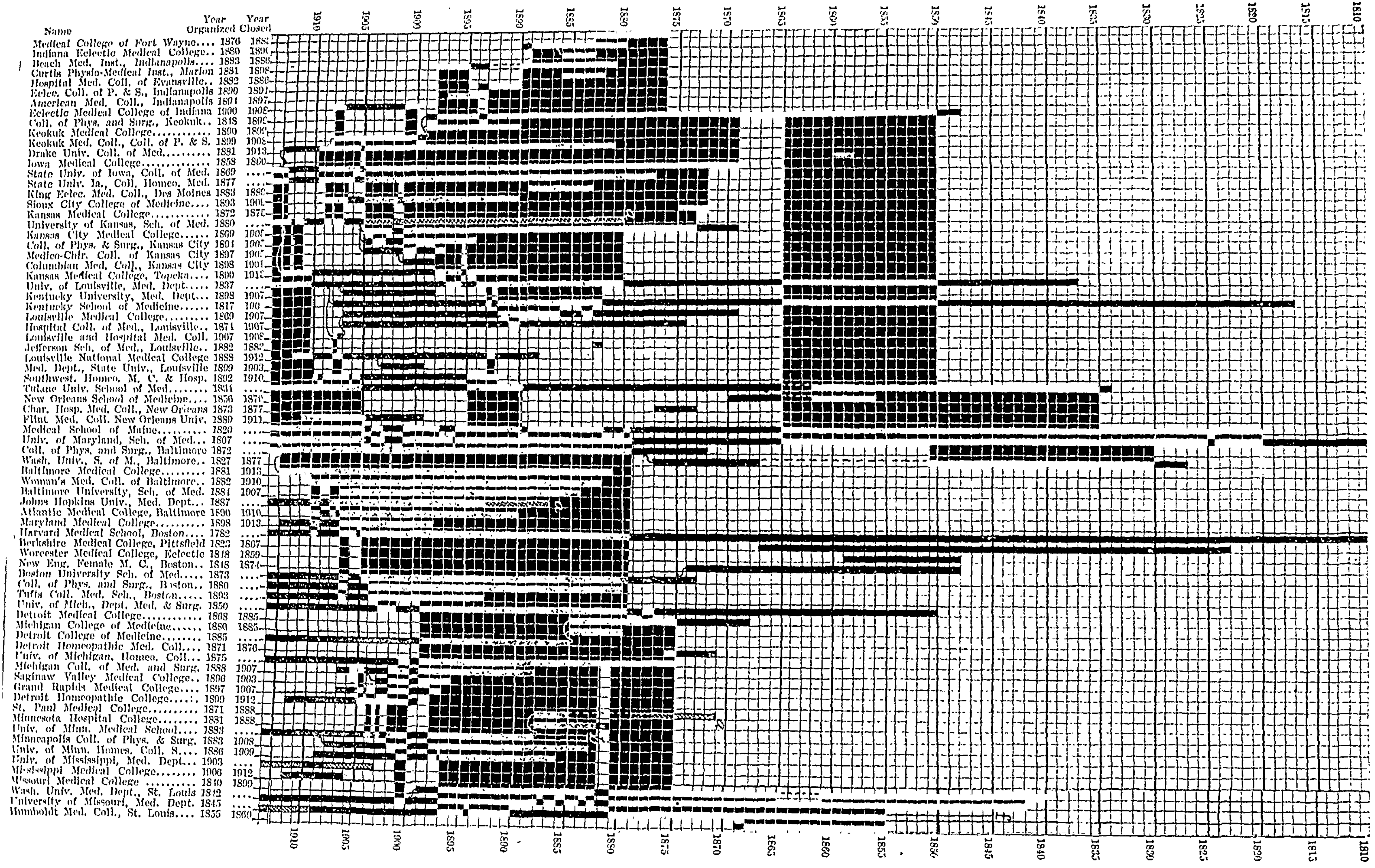
[1] These institutions are more fully described in the American Medical Directory.

LIFE CHART OF THE MEDICAL COLLEGES OF THE UNITED STATES

Name	Year Organized	Year Closed
raffenburg Institute..............	1852	1862
niv. of Ala., Med. Dept., Mobile	1859	....
outhern Univ., M. D., Greensboro	1872	1880
irmingham Medical College......	1894	....
ed. Coll. Mont. Univ., Bessemer	1896	1898
niversity of Arkansas, Med. Dept.	1879	....
oll. of Phys. & Surg., Little Rock	1906	1911
ooper Med. *Coll., San Francisco*..	1858	1912
eland Stan. Jr. Univ., C. of M.	1908	....
niv. of California, Med. Dept....	1863	....
niv. of Southern Calif., C. of M.	1885	1909
alifornia Eclectic Med. Coll......	1879	....
ahnem[illegible] of Pac., San Fran.	1883	....
oll [illegible]s. and Surg., San Fran..	1896	....
[illegible]d Coll. of Med. and Surg...	1902	....
[illegible]. Phys. and Surg.. Los Angeles	1903	....
oll. Med. Evang., Loma Linda, Cal.	1909	....
enver College of Medicine........	1881	1902
ross Medical College, Denver.....	1887	1902
enver and Gross Coll. of Med.....	1902	1911
niversity of Colo., Sch. of Med...	1883	....
enver Coll. of Phys. and Surg...	1894	1909
ale Univ. Med. Dept., New Haven	1813	....
eorge Wash. Univ., Dept. of Med.	1825	....
ational Univ. Med. Dept., Wash..	1884	1903
eorgetown Univ. S. of M., Wash.	1851	....
Howard Univ., Sch. of Med., Wash.	1868	....
ashington Homeopathic Med. Coll.	1893	1896
allahassee Coll. of Med. and Surg.	1883	1886
University of Georgia, Med. Dept...	1828	....
Southern Botanico-M. C., Macon...	1839	1881
Georgia Coll. Eclectic Med. & Surg.	1877	....
Savannah Medical College.........	1853	1880
Atlanta Medical College..........	1855	1898
Southern Medical College, Atlanta	1878	1898
Atlanta College of Phys. and Surg.	1898	1912
Oglethorpe Med. Coll., Savannah...	1856	1861
Atlanta School of Medicine........	1905	1913
International Med. Miss. Coll......	1904	1908
Hosp. Med. Coll., Eclectic, Atlanta	1908	1911
South. Coll. Med. & Surg., Atlanta	1911	....
Rush Medical College, Chicago....	1843	....
Med. Dept. Ill. Coll., Jacksonville	1843	1848
Hahnemann Med. Coll. & *Hosp. Chi.*	1859	....
Chicago Homeopathic Med. College	1876	1904
Coll. M. & S. (Physio-Medical) Chi.	1885	1911
Chi. C. *of M. & S. (Physio-Medical)*	1897	1899
Chgo Coll. Med. & Surg., Chicago	1901	....
Northwest'n Univ. Med. Sch., Chgo	1859	....
Bennett Medical College, Chicago..	1868	....
Illinois Medical College, Chicago..	1894	1910
Reliance Medical College, Chicago.	1907	1911
Nor'w'n Univ. Woman's Med. Coll.	1870	1902
University of Illinois, Coll. of Med.	1882	....
Amer. Med. Miss. Coll., Chicago..	1895	1910
Chaddock Sch. of Med., Quincy...	1882	1890
Harvey Medical College, Chicago..	1891	1905
National Med. Univ., Chicago.....	1891	1909
Jenner Medical College, Chicago..	1892	....
Hering Medical College, Chicago..	1892	1913
Dunham Medical College, Chicago..	1895	1902
Dearborn Medical College, Chicago	1903	1907
Indiana Medical College, La Porte.	1844	1849
Medical College of Evansville......	1849	1881
Indiana Central Medical College...	1850	1854
Indiana Medical College............	1869	1878
Coll. of Phys. & Surg. of Indiana..	1873	1878
Medical College of Indiana........	1878	1905
Cent. Coll. of P. & S., Indianapolis	1879	1905
Fort Wayne College of Medicine...	1879	1905
Indiana Medical College...........	1905	1908
Indiana Univ. Sch. of Med.........	1893	....
State Coll. of P. & S., Indianapolis	1906	1907
Physio-Medical College of Indiana.	1873	1909




Name
Year Organized
Year Closed
Medical College of Fort Wayne.... 1876 188
Indiana Eclectic Medical College.. 1880 189
Beach Med. Inst., Indianapolis.... 1883 1886
Curtis Physio-Medical Inst., Marion 1881 1898
Hospital Med. Coll. of Evansville.. 1882 1886
Eclec. Coll. of P. & S., Indianapolis 1890 1891
American Med. Coll., Indianapolis 1891 1897
Eclectic Medical College of Indiana 1900 1908
Coll. of Phys. and Surg., Keokuk.. 1848 1899
Keokuk Medical College........... 1890 1899
Keokuk Med. Coll., Coll. of P. & S. 1899 1908
Drake Univ. Coll. of Med......... 1891 1913
Iowa Medical College............. 1858 1860
State Univ. of Iowa, Coll. of Med. 1869 ....
State Univ. Ia., Coll. Homeo. Med. 1877 ....
King Eclec. Med. Coll., Des Moines 1883 1889
Sioux City College of Medicine.... 1893 1909
Kansas Medical College........... 1872 1875
University of Kansas, Sch. of Med. 1880 ....
Kansas City Medical College...... 1869 1905
Coll. of Phys. & Surg., Kansas City 1894 1907
Medico-Chir. Coll. of Kansas City 1897 1905
Columbian Med. Coll., Kansas City 1898 1901
Kansas Medical College, Topeka.... 1890 1913
Univ. of Louisville, Med. Dept..... 1837 ....
Kentucky University, Med. Dept... 1898 1907
Kentucky School of Medicine...... 1817 190
Louisville Medical College......... 1869 1907
Hospital Coll. of Med., Louisville.. 1874 1907
Louisville and Hospital Med. Coll. 1907 1908
Jefferson Sch. of Med., Louisville.. 1882 1887
Louisville National Medical College 1888 1912
Med. Dept., State Univ., Louisville 1899 1903
Southwest. Homeo. M. C. & Hosp. 1892 1910
Tulane Univ. School of Med....... 1834 ....
New Orleans School of Medicine.... 1856 1870
Char. Hosp. Med. Coll., New Orleans 1873 1877
Flint Med. Coll. New Orleans Univ. 1889 1911
Medical School of Maine.......... 1820 ....
Univ. of Maryland, Sch. of Med... 1807 ....
Coll. of Phys. and Surg., Baltimore 1872 ....
Wash. Univ., S. of M., Baltimore.. 1827 1877
Baltimore Medical College......... 1881 1913
Woman's Med. Coll. of Baltimore.. 1882 1910
Baltimore University, Sch. of Med. 1884 1907
Johns Hopkins Univ., Med. Dept... 1887 ....
Atlantic Medical College, Baltimore 1890 1910
Maryland Medical College.......... 1898 1913
Harvard Medical School, Boston.... 1782 ....
Berkshire Medical College, Pittsfield 1823 1867
Worcester Medical College, Eclectic 1848 1859
New Eng. Female M. C., Boston.. 1848 1874
Boston University Sch. of Med..... 1873 ....
Coll. of Phys. and Surg., Boston.. 1880 ....
Tufts Coll. Med. Sch., Boston..... 1893 ....
Univ. of Mich., Dept. Med. & Surg. 1850 ....
Detroit Medical College........... 1868 1885
Michigan College of Medicine...... 1880 1885
Detroit College of Medicine........ 1885 ....
Detroit Homeopathic Med. Coll.... 1871 1876
Univ. of Michigan, Homeo. Coll... 1875 ....
Michigan Coll. of Med. and Surg. 1888 1907
Saginaw Valley Medical College.. 1896 1903
Grand Rapids Medical College.... 1897 1907
Detroit Homeopathic College..... 1899 1912
St. Paul Medical College......... 1871 1888
Minnesota Hospital College........ 1881 1888
Univ. of Minn. Medical School.... 1883 ....
Minneapolis Coll. of Phys. & Surg. 1883 1908
Univ. of Minn. Homeo. Coll. S.... 1886 1909
Univ. of Mississippi, Med. Dept... 1903 ....
Mississippi Medical College........ 1906 1912
Missouri Medical College 1840 1899
Wash. Univ. Med. Dept., St. Louis 1842 ....
University of Missouri, Med. Dept. 1845 ....
Humboldt Med. Coll., St. Louis.... 1855 1869
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CALIFORNIA

California Medical Society and College of Physicians, San Francisco.
Pacific Coast Regular College of Medicine, San Francisco.*

GEORGIA

Clark University, Medical Department, Atlanta.
Dalton Medical College, Dalton.
Middle Georgia Medical College, Griffin.
Thompsonian College, Barborville.
Woman's Medical College of Georgia.

ILLINOIS

Chicago College of Science.*
Dutton Medical College, Chicago.*
Edinburg University, Chicago.*
German Academy of Physiatric Physicians, Chicago.*
German-American Homeopathic Medical College, Chicago.*
German College of Gynecology, Pediatrics and Obstetrics, Chicago.*
German College of Medicine and Obstetrics, Chicago.*
German Homeopathic Medical College, Chicago.*
German Medical College, Chicago.*
Illinois Health University, Chicago.*
Illinois Standard College of Medicine and Surgery, Chicago.
Independent Medical College, Chicago.*
International Medical Missionary Institute, Chicago.
Medical Department of the University of St. Charles.
Metropolitan Medical College, Chicago.*
National University of Illinois, Chicago.*

INDIANA

Indiana College of Medicine and Midwifery.*
University of Indiana, New Albany.*
University of Indianapolis.*
University of Medicine, Indianapolis.

IOWA

Council Bluffs Medical College.

KANSAS

Wichita Medical College.

KENTUCKY

Eclectic Medical College, Louisville.

MAINE

Druidic University of Maine, Lewiston.*
Eclectic Medical College of Maine, Lewiston.*
Portland School for Medical Instruction.

MARYLAND

Medico-Chirurigical and Theological College of Christ's Institute.*

MASSACHUSETTS

Bellevue Medical College of Massachusetts, Boston.*
Clark University, Medical Department, Worcester.
Excelsior Medical College, Boston.*
First Medical College of the American Health Society, Boston.*
Medical Department of the American University of Boston.*
New England University of Arts and Science, Boston.*
Reserved College of Physicians and Surgeons, Springfield.*

MICHIGAN

Detroit University of Medicine.
Detroit University of Rational Medicine and Surgery.
Michigan Eclectic Medical College, Detroit.
Michigan Homeopathic Medical College, Lansing.
Michigan Medical College, Lansing.
Michigan School of Homeopathy and Surgery, Detroit.

MINNESOTA

Winona Medical School, Preparatory.

MISSOURI

American Anthropological University of St. Louis.*
Hippocratean College of Medicine, St. Louis.*
Homeopathic Medical College of St. Louis.*
Missouri Eclectic Medical College, Kansas City.
Missouri Eclectic Medical College, Kansas City.
Mo. School of Midwif. and Dis. of Women and Children, St. Louis.*
Occidental College of Physicians and Surgeons, Joplin.
St. Louis Eclectic Medical College.*
St. Louis Hygienic College of Physicians and Surgeons.

NEW HAMPSHIRE

New England University of Arts and Sciences, Manchester.*
University of New Hampshire, Department of Medicine, Nashua.*

NEW JERSEY

Central University of Medicine and Science, Jersey City.*
Hygieo-Therapeutic College, Bergen Heights.*
Livingston University, Haddonfield.*
Medical and Surgical College of the State of New Jersey.*

NEW YORK

American College of Medical Science, New York.
Brooklyn Academy of Medicine.
Buffalo College of Rational Medicine, Homeopathic.*
College of Medicine, Botanic, New York.*
College of Medicine, Botanic, New York, Rochester.
Eclectic Medical Institute of New York, Rochester.
Edwards Medical College, New York.*
Excelsior Medical College, New York.*
Hamburg Canal College, Buffalo *
Medical Faculty of Rutger's (Queen's) College, New York.*
Medical and Surgical Institute and Sanitarium, Buffalo.*
Metropolitan Medical College, Eclectic, New York.*
Mohawk Medical College, Buffalo.*
New York College of Magnetics.*
New York Hygeio-Therapeutic College, New York.*
New York Institute of Medical Science.*
New York Preparatory School of Medicine.*
New York Reformed Medical College, Eclectic.*
New York School of Medicine.
Preparatory Medical College, New York City and Poughkeepsie.
Randolph Eclectic Medical Institute, Rochester.
Rochester Eclectic Medical College.*
Syracuse Medical College, Eclectic, Rochester.*
Worcester Medical School, Eclectic, New York.*

NORTH CAROLINA

College of Physicians and Surgeons, Arlington.
Edinborough Medical College, Lumbertown.

OHIO

American Health College, Cincinnati.*
Hygeia Medical College, Cincinnati.*
International Electropathic Institution, Mentor.*
Medical University of Ohio, Cincinnati.*
Ohio College of Medicine and Midwifery, Cincinnati.*
Physio-Electic Medical College, Cincinnati.
Toledo School of Medicine.
Zanesville Academy of Medicine.*

OKLAHOMA

Twentieth Century Physio-Medical College, Guthrie.*

PENNSYLVANIA

American University of Pennsylvania (Eclectic), Philadelphia.*
Eclectic Medical College of Pennsylvania, Philadelphia.*
Electropathic Institute, Philadelphia.*
Lincoln University, Medical Department, Oxford.
North American Acad. of the Homeopathic Healing Art, Allentown.
Thompsonian Medical College, Allentown.*

SOUTH CAROLINA

Charleston Medical School.

TENNESSEE

Jefferson Medical Association, Dandridge.

TEXAS

University of Medicine and Surgery, Dallas.
University of San Antonio, Medical Department.

UTAH

Medical Institution of Morgan City.

VERMONT

Trinity University College of Medicine and Surgery, Bennington.*
Union Medical Institute, Newbury.*
Vermont Medical College, Rutland.*

WASHINGTON

Northwestern College of Biochemistry, Spokane.*
University of Spokane Falls, College of Medicine.
University of Washington, Medical Department, Seattle.

WISCONSIN

Milwaukee College of Physicians and Surgeons.*
Wisconsin Eclectic Medical School.*

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* Reports indicate these institutions were fraudulent or not in good standing with the home state licensing board.

STANDARDS OF THE COUNCIL ON MEDICAL EDUCATION OF THE AMERICAN MEDICAL ASSOCIATION

Essentials of an Acceptable Medical College

(Revised to August 1, 1913)

The following outline of the essentials of an acceptable medical college was issued by the Council on Medical Education of the American Medical Association for its suggestive value in the rapid development in progress among the medical colleges in the United States. It also represents the basis on which medical colleges are rated in the Council's classifications.

ADMISSION OF STUDENTS

1. A strict enforcement of all standards and requirements, the college itself to be held responsible for any instances in which they are not enforced.

[Since the product of the medical school depends largely on the quality of the students admitted, it is only reasonable that in its ratings hereafter, special emphasis be laid by the Council on the strictness and honesty by which the standards of admission and advanced standing are administered. By the admission of unfit students the school is handicapped from the very beginning and, in the opinion of the Council, deserves a low rating regardless of its equipment, its clinical facilities and its teaching force.]

2. A requirement for admission of at least a four-year-high-school education, and—on and after Jan. 1, 1914—in addition at least one year of college work, including at least eight semester hours each of physics, chemistry, biology and German or French.

3. These minimum requirements for admission to the study of medicine are set forth in the following statements relating (1) to the high school work and (2) to the work of the preliminary college year. The prescribed minimum of work in physics, chemistry, biology and German or French should be required by every medical school whether given in a preliminary year by the medical school itself or required in one or more years of collegiate work. The statements are as follows:

ADMISSION TO THE PRELIMINARY COLLEGE YEAR

(a) For admission to the preliminary college year, students must have completed a four-year course of at least fourteen units in a standard accredited high-school, or have its equivalent as demonstrated by an examination, and a transcript of the student's work should be secured directly from the principal of the high school by the college authorities and kept on file.

(b) The required and elective subjects for which credits for admission to the preliminary college year may be accepted are shown in the following schedule:

SCHEDULE OF SUBJECTS OFFERED IN ACADEMIC AND SECONDARY SCHOOLS, CREDITS IN WHICH ARE ACCEPTABLE FOR ENTRANCE TO THE PRELIMINARY COLLEGE YEAR LEADING TO THE MEDICAL COURSES

SUBJECTS	UNITS	REQUIRED	ELECTIVE
ENGLISH			
READING AND PRACTICE	2	2	...
Study and Practice	1	...	1
MATHEMATICS			
ALGEBRA TO QUADRATICS	1	1	..
Algebra (Quadratic Equations, Binomial Theorem and Progressions)	½	...	½
PLANE GEOMETRY	1	1	...
Solid Geometry	½	...	½
Trigometry	½	...	½
LATIN			
GRAMMAR AND COMPOSITION	1	*	1
CAESAR	1	*	1
Cicero	1	...	1
Virgil	1	...	1
Cornelius Nepos	1	...	1
Greek			
Grammar and Composition	1		1
Xenophon	1	...	1
Homer	1	...	1
GERMAN (OR FRENCH)			
ELEMENTARY	2	2*	...
Intermediate	1	...	1
Spanish			
Elementary	2	...	2
Scandinavian			
Elementary	2	...	2
HISTORY			
AMERICAN HISTORY AND CIVIL GOVERNMENT	1	1	...
Greek and Roman History	1	...	1
Medieval and Modern History	1	...	1
English History	1	...	1
Science †			
Botany and Zoology, each	1	...	1
or Biology	1	...	1
Chemistry	1	...	1
Physics	1	...	1
Physiography	½	...	½
Physiology	½	...	½
Agriculture	1	...	1
Drawing	1	..	1
Manual Training	1	...	1
Domestic Science	1	..	1
Music			
Appreciation or Harmony	1	...	1
Total	38½	7	31½

A *unit* is the credit value of at least 36 weeks' work of 4 or 5 recitation periods per week, each recitation period to be of not less than 40 minutes. In other words, a unit represents a year's study in any subject in a secondary school constituting approximately a quarter of a full year's work. A satisfactory year's work in any subject cannot be accomplished under ordinary circumstances in less than 120 sixty-minute hours, or their equivalent.

Required Branches: Of the 14 units of high-school work the subjects in capitals aggregating 7 units are required. Other work to the amount of at least 7 units may be made up from any of the other subjects of the above schedule.

* Two units of Greek or Latin may be substituted for the two required units of French or German.

† Credentials of each science course must include evidence of laboratory work.

WORK OF THE PRELIMINARY COLLEGE YEAR

(c) The preliminary college year shall extend through one college session of at least thirty-two weeks of actual instruction, including final examinations.

(d) In excellence of teaching and in content, the work of this preliminary college year shall be equal to the work done in the freshman year in standard colleges and universities.

(e) This preliminary college year shall include courses in physics, chemistry, biology and German or French, each course to embrace at least eight semester hours of didactic and laboratory work in each subject as shown in the following schedule, provided that a student may satisfy the requirement of physics in presenting one unit of high-school physics and completing a half year of college physics which continues and does not duplicate the work done in the high school:

SCHEDULE

Subject	Lectures or Recitations Per Week	Laboratory Periods * Per Week	Total Hours Per Semester	Total Semester Hours Per Year
Physics, 1	2	2	4	8
Chemistry, 1	2	2	4	8
Biology, 1	2 or 3	2 or 1	4	8
German or French, 2	4 or 3	....	4 or 3	8 or 6
Total	10	6 or 5	16 or 15	32 or 30

* Each laboratory period must extend over at least two hours.

OR, EXPRESSED IN CLASS HOURS:

Subject	Total Hours Lectures, or Recitations	Total Hours Laboratory Work	Total Minimum Hours Didactic and Laboratory
Physics, 1	64	128	192
Chemistry, 1	64	128	192
Biology, 1	64 or 96	128 or 64	192 or 160
German or French, 2	128 or 96	... ...	128 or 96
Totals	320	384 or 320	704 or 640

(f) If a satisfactory "reading knowledge" of German or French is to be obtained in the one year of college work it is essential that an advanced course be offered and that the student have completed as a prerequisite in the high school two units of elementary work in German or French.

(g) By requiring two years of collegiate work for admission medical schools would have a greater latitude in the acceptance of high-school credentials. For example, the language requirement in the high school would not be so essential since the deficiency could easily be made up in the two years of collegiate work.

(h) It is understood, however, that a requirement of two or more years of collegiate work will not excuse the medical school from requiring the completion of a standard four-year high-school course as a prerequisite to that college work. In other words, "college work" will not be recognized as such by the Council unless the specified amount of high-school work has been required as a prerequisite

(i) It is also understood that a requirement of two or more years of collegiate work will not be considered acceptable unless courses in physics, chemistry, biology and German or French, the minimum amount of which is specified in the above table, are included.

(j) In medical colleges planning to give the work of the preliminary year, provision should be made for full-time expert teachers in the various subjects. Sufficient equipment should be provided to enable the students to do the work intelligently—in amount such as will compare favorably with the equipment for these courses in standard colleges and universities.

(k) The chief object of the work of the preliminary college year is to provide the student with a training that will enable him to enter more readily and intelligently on the study of the fundamental medical sciences in the medical school.

4. The college should require that students be in actual attendance in the college within the first week of each annual session and thereafter.

5. Actual attendance at classes should be insisted on except for good cause, such as for sickness, and under no circumstances should credit be given for any course where the attendance has been less than 80 per cent. of the full time.

6. (a) Full advanced standing may be granted to students only for work done in other acceptable colleges and in granting advanced standing there should be no discrimination against the college's full-course students. (b) Students from Class B medical schools should not be given advanced standing higher than *entrance* to the third year (junior) class and no credit should be given in any subject except on the recommendation of the head of the department teaching that subject. (c) Students from Class C colleges should not be given advanced standing higher than *entrance* to the second year (sophomore) class and then only after thorough examinations in all first year subjects have been passed. It is only in *exceptional cases* that such credit can be granted for work done in Class B and Class C colleges.

SUPERVISION, EQUIPMENT, TEACHERS

7. There should be careful and intelligent supervision of the entire school by a dean or other executive officer who holds, and has sufficient authority to carry out fair ideals of medical education as interpreted by modern knowledge.

8. There should be a good system of records showing conveniently and in detail the credentials, attendance, grades and accounts of the students by means of which an exact knowledge can be obtained regarding each student's work.

9. A fully graded course covering four years of at least 32 weeks each, exclusive of time required for matriculation and holidays, and at least 30 hours per week of actual work; this course should be clearly set forth in a carefully prepared and printed schedule of lectures and classes.

10. Two years of work consisting largely of laboratory work in thoroughly equipped laboratories in anatomy, histology, embryology, physiology, chemistry (inorganic, organic and physiologic), bacteriology, pathology, pharmacology, therapeutics and clinical diagnosis. Present day medical knowledge makes it quite essential that these subjects be in charge of full-time, thoroughly trained teachers.

11. Two years of clinical work largely in hospitals and dispensaries, with thorough courses in internal medicine (including physical diagnosis, pediatrics, nervous and mental diseases), surgery (including surgical anatomy and operative surgery on the cadaver), obstetrics, gynecology, laryngology, rhinology, ophthalmology, otology, dermatology, hygiene and medical jurisprudence.

12. As soon as conditions warrant, a fifth undergraduate year should be required which should be spent by the student as an intern in an approved hospital.

13. At least six expert, thoroughly trained professors in the laboratory branches, salaried so that they may devote their entire time to instruction and to that research without which they cannot well keep up with the rapid progress being made in their subjects. These professors should have a definite responsibility in the conduct of the college, and their first and chief interest should be in the training of the medical students. It is advised that four of these professors be placed in charge of the departments of (*a*) anatomy, (*b*) physiology, (*c*) pathology and bacteriology and (*d*) physiologic chemistry and pharmacology. The other two may be assigned one to the laboratory course in histology and embryology under the department of anatomy and the other to the department of pathology and bacteriology, possibly, to the course in laboratory clinical diagnosis. There should also be a sufficient number of assistants in each department to look after the less important details. For colleges having sixty students or less in each class, there should be at least one full-time salaried assistant for each of the four departments mentioned, and at least one additional assistant in each of these departments should be provided for each additional thirty students enrolled. This represents a low average of the full-time assistants already employed by the accepted medical colleges.

14. The faculty should be thoroughly organized and should be made up of graduates of institutions recognized as medical colleges and who have had a training in all departments of medicine. Non-medical men should be selected as teachers in medical schools only under exceptional circumstances and only because medical men of equal special capacity are not available. All faculty members should be appointed because of their ability as teachers and not because they happen to be on the attending staff of a hospital or for other like reasons.

CLINICAL FACILITIES

15. The college should own or entirely control a hospital in order that students may come into close and extended contact with patients under the supervision of the attending staff. This hospital should be in close proximity to the college and have a daily average (for senior classes of 100 students or less) of not less than 200 patients which can be utilized for clinical teaching, these patients to be of such character as to permit the student to see and study the common variety of surgical and medical cases as well as a fair number in each of the so-called specialties.

16. The college should also have ample hospital facilities for children's diseases, contagious diseases and nervous and mental diseases.

17. Facilities for at least six maternity cases for each senior student, who should have actual charge of these cases under the supervision of the attending physician. Careful records of each case should be handed in by the student.

18. Facilities for at least 30 autopsies during each college session which are attended and can be participated in by senior students (for senior classes of 100 students or less).

19. A dispensary, or out-patient department, under the control of the college, the attendance to be a daily average of 60 cases (for senior classes of 100 students or less), the patients to be carefully classified, good histories and records of the patients to be kept and the material to be well used. The attending staff should be made up of good teachers, should be well organized and be regular in attendance.

OTHER TEACHING FACILITIES

20. The college should have a working medical library to include the more modern text and reference books with the *Index Medicus* and 30 or more leading medical periodicals; the library room should be properly lighted and heated, and easily accessible to students during all or the greater part of the day; it should be equipped with suitable tables and chairs, and have a librarian in charge.

21. A working medical museum having its various anatomic, embryologic, pathologic and other specimens carefully prepared, labeled and indexed so that any specimen may be easily found and employed for teaching purposes. It is suggested that so far as possible with each pathologic specimen coming from post-mortems there also be kept the record of the post-mortem, the clinical history of the patient on whom the autopsy was held and microscopic slides showing the minute structures of the disease shown in the gross specimen.

22. There should be sufficient dissecting material to enable each student individually to dissect at least the lateral half of the human cadaver; to provide cross-sections and other demonstration material and to allow of a thorough course for each senior in operative surgery on the cadaver.

23. For modern experimental laboratory work in physiology, pharmacology and bacteriology as well as for a reasonable amount of medical research, a supply of animals—frogs, turtles, rabbits and guinea-pigs, if not also cats and dogs—is essential. Proper provision, also, is necessary for the housing and care of such animals. In any use made of animals great care should be used to prevent needless suffering and work by students should be carefully supervised.

24. A supply of such useful auxiliary apparatus as a stereopticon, a reflectoscope, carefully prepared charts, embryologic or other models, manikins, dummies for use in bandaging, a Roentgen-ray and other apparatus now so generally used in medical teaching.

25. The college should show evidences of thorough organization and of reasonably modern methods in all departments and evidences that the equipment and facilities are *being intelligently used* in the training of medical students.

26. A clear statement of the college's requirements for admission, tuition, time of attendance on the classes, sessions, courses offered and graduation should be clearly set forth, together with complete classified lists of its matriculants and latest graduating class in regular annual catalogues or announcements.

NOTE.—Correspondence from medical colleges regarding any of the above requirements is invited, and any further suggestions or information available will be gladly furnished.

Definitions of a Medical College [*] and a Medical School [†]

"An institution to be ranked as a medical college must have at least (6) professors giving their entire time to medical work, a graded course of four full years of college grade in medicine, and must require for admission not less than the usual four years of academic or high-school preparation, or its equivalent, in addition to the preacademic or grammar school studies."

By a medical school as differentiated from a medical college is meant a part of a university requiring for admission the equivalent of two years of collegiate work and offering instruction of not less than two years' duration, leading to the degree of Doctor of Medicine.

Grading of Medical Colleges

As in the previous classifications, all medical colleges were rated by the Council on Medical Education on a civil service basis on a scale of 1,000 points. The data relating to each college were grouped under ten general heads in such manner that the groups would have as nearly equal weight as possible, each group, allowing a possible 100 points (10 per cent.) out of a possible 1,000 points (100 per cent.). The ten heads under which the data were arranged are as follows:

1. Showing of graduates before state boards and other evidences of the training received.
2. Enforcement of a satisfactory preliminary educational requirement, granting of advanced standing and the character of records.
3. Character of curriculum, grading of course, length of session, time allowed for matriculation and supervision.
4. Medical school buildings; light, heat, ventilation, cleanliness.
5. Laboratory facilities and instruction.
6. Dispensary facilities and instruction.
7. Hospital facilities and instruction, maternity work, autopsies, specialties.
8. Faculty, number and qualifications of trained teachers, full-time instructors, and assistants, especially of the laboratory branches, organization, and extent of research work.
9. Extent to which the school is conducted for properly teaching the science of medicine rather than for the profit of the faculty directly or indirectly.
10. Possession and use made of libraries, museums, charts, stereopticons, etc.

Class A+ colleges are those which are acceptable; Class A those which need improvement in certain respects, but which are otherwise acceptable; Class B, those which, under their present organization, might be made acceptable by general improvements, and Class C, those which require a complete reorganization to make them acceptable.

CLASS A PLUS—ACCEPTABLE MEDICAL COLLEGES

1. *Giving an acceptable four-year course:*

California

Leland Stanford Junior Univ., Dept. of Med....San Francisco
Univ. of California, Med. Dept.....San Francisco-Los Angeles

Connecticut

Yale Medical School.............................New Haven

Illinois

Northwestern University Medical School.............Chicago
Rush Medical College (University of Chicago)........Chicago

Indiana

Indiana University School of Med...Bloomington-Indianapolis

Iowa

State University of Iowa, College of Medicine......Iowa City

Louisiana

Tulane University of Louisiana, Med. Dept......New Orleans

Maryland

Johns Hopkins University Medical Department.....Baltimore

Massachusetts

Harvard Medical School ....Boston

Michigan

University of Michigan, Dept. of Med. and Surg....Ann Arbor

Minnesota

University of Minnesota, Coll. of Med. and Surg...Minneapolis

Missouri

Washington University Medical School..............St. Louis

New York

Columbia University Coll. of Phys. and Surgs..New York City
Cornell University Medical College............New York City
University and Bellevue Hospital Med. Coll....New York City
Syracuse University, College of Medicine............Syracuse

Ohio

Ohio-Miami Med. Coll. of the Univ. of Cincinnati....Cincinnati
Western Reserve University Medical Department....Cleveland

Pennsylvania

University of Pennsylvania, Dept. of Medicine...Philadelphia

Texas

University of Texas, Department of Medicine.......Galveston

Virginia

University of Virginia, Department of Med....Charlottesville

2. *Giving a two-year course acceptably:*

Missouri

University of Missouri, School of Medicine..........Columbia

Wisconsin

University of Wisconsin, College of Medicine........Madison

Total 24.

CLASS A.—COLLEGES LACKING IN CERTAIN RESPECTS BUT OTHERWISE ACCEPTABLE

1. *Giving a complete four-year course:*

Alabama

University of Alabama, School of Medicine.............Mobile

Colorado

University of Colorado, School of Medicine....Boulder-Denver

District of Columbia

Georgetown University School of Medicine.......Washington
George Washington University, Dept. of Medicine..Washington
Howard University, School of Medicine...........Washington

Georgia

University of Georgia, College of Medicine[1]..........Augusta

Illinois

College of Physicians and Surgeons...................Chicago

Iowa

Drake University College of Medicine[2]...........Des Moines
State University of Iowa, Homeopathic College....Iowa City

Kansas

University of Kansas, School of Medicine...Lawrence-Rosedale

Kentucky

University of Louisville, Medical Department......Louisville

Maine

Medical School of Maine................Brunswick-Portland

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[*] This definition of a college is based on that given in the revised ordinances of the state of New York. It has been adopted also by the Carnegie Foundation for the Advancement of Teaching.

[†] Based on the definition of the term "school" adopted in 1909 by the Association of American Universities.

[1] Rating changed to Class A, Feb. 24, 1913

[2] Merged with the State University of Iowa College of Medicine in 1913.

Maryland

Baltimore Medical College[3]	Baltimore
College of Physicians and Surgeons	Baltimore
University of Maryland, School of Medicine	Baltimore

Massachusetts

Boston University School of Medicine	Boston
Tufts College Medical School	Boston

Michigan

University of Michigan, Homeopathic College	Ann Arbor

Missouri

St. Louis University School of Medicine	St. Louis

Nebraska

University of Nebraska, College of Medicine	Lincoln-Omaha

New Hampshire

Dartmouth Medical School	Hanover

New York

Albany Medical College	Albany
New York Homeo. Med. Coll. and Flower Hosp.	New York City
University of Buffalo, Medical Department	Buffalo

Ohio

Starling-Ohio Medical College	Columbus

Oregon

University of Oregon, Medical Department	Portland

Pennsylvania

Hahnemann Medical College and Hospital	Philadelphia
Jefferson Medical College	Philadelphia
Medico-Chirurgical College of Philadelphia	Philadelphia
Woman's Medical College of Pennsylvania	Philadelphia
University of Pittsburgh, School of Medicine	Pittsburgh

Tennessee

Meharry Medical College	Nashville
Vanderbilt University, Medical Department	Nashville

Vermont

University of Vermont, College of Medicine	Burlington

Virginia

Medical College of Virginia[4]	Richmond
University College of Medicine[4]	Richmond

2. *Giving a two-year course:*

Mississippi

University of Mississippi, Medical Department	Oxford

North Carolina

University of North Carolina, School of Medicine	Chapel Hill
Wake Forest College, School of Medicine	Wake Forest

North Dakota

University of North Dakota, College of Medicine	University

South Dakota

University of South Dakota, College of Medicine	Vermilion

Utah

University of Utah, School of Medicine	Salt Lake City

Total 42.

CLASS B.—COLLEGES NEEDING GENERAL IMPROVEMENTS TO BE MADE ACCEPTABLE

1. *Giving a complete four-year course:*

Alabama

Birmingham Medical College[5]	Birmingham

Arkansas

University of Arkansas, Medical Department	Little Rock

California

College of Physicians and Surgeons	Los Angeles
Hahnemann Medical College of the Pacific	San Francisco
Oakland College of Medicine and Surgery	Oakland

Georgia

Atlanta College of Physicians and Surgeons[6]	Atlanta
Atlanta School of Medicine[6]	Atlanta

Illinois

Bennett Medical College	Chicago
Chicago College of Medicine and Surgery	Chicago
Hahnemann Medical College and Hospital	Chicago

Kansas

Kansas Medical College[7]	Topeka

Michigan

Detroit College of Medicine	Detroit

Missouri

University Medical College[8]	Kansas City

Nebraska

John A. Creighton Medical College	Omaha

New York

Fordham University, School of Medicine	New York City
Long Island College Hospital	Brooklyn

Ohio

Eclectic Medical College	Cincinnati

Oklahoma

State Univ. of Okla., School of Med.	Norman-Oklahoma City

Pennsylvania

Temple University, Department of Medicine	Philadelphia

South Carolina

Medical College of the State of South Carolina[9]	Charleston

Tennessee

Memphis Hospital Medical College[10]	Memphis
University of Tennessee, Medical Department	Memphis

Texas

Baylor University College of Medicine	Dallas

2. *Giving a two-year course:*

West Virginia

West Virginia University College of Medicine	Morgantown

Total 24.

CLASS C.—COLLEGES REQUIRING A COMPLETE REORGANIZATION TO MAKE THEM ACCEPTABLE

California

California Eclectic Medical College	Los Angeles
College of Physicians and Surgeons	San Francisco
College of Medical Evangelists	Loma Linda

Georgia

Georgia College of Eclectic Medicine and Surgery	Atlanta
Southern College of Medicine and Surgery	Atlanta

Illinois

Chicago Hospital College of Medicine[11]	Chicago
Hering Medical College[12]	Chicago
Jenner Medical College[11]	Chicago

Maryland

Maryland Medical College[12]	Baltimore

Massachusetts

College of Physicians and Surgeons[14]	Boston

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3. This college has merged with the University of Maryland School of Medicine.

4. These schools have been merged.

5. When the two classes now enrolled have been graduated this college will offer only a postgraduate medical course.

6. These colleges have been merged under the name of Atlanta Medical College.

7. This college has been merged with the University of Kansas School of Medicine.

8. College reported closed.

9. Rating raised to Class B, Feb. 24, 1913.

10. Has merged with the University of Tennessee Medical Department.

11. Reported not in good standing by the Illinois State Board of Health.

12. College reported closed.

13. Reported not fully recognized by twenty-nine different state licensing boards.

14. This college is reported as not recognized by the Massachusetts Medical Society.

MISSOURI

American Medical College	St. Louis
Eclectic Medical University[15]	Kansas City
Ensworth Medical College[16]	St. Joseph
Kansas City Hahnemann Medical College	Kansas City
St. Louis College of Physicians and Surgeons	St. Louis

NEBRASKA

Cotner University Medical College	Lincoln

NEW YORK

Eclectic Med. Coll. of the City of New York[17]	New York City
New York Med. Coll. and Hosp. for Women	New York City

NORTH CAROLINA

Leonard Medical School	Raleigh, N. C.
North Carolina Medical College.	Charlotte

OHIO

Cleveland-Pulte Medical College	Cleveland
Toledo Medical College	Toledo

OREGON

Willamette University Medical Department[18]	Salem

TENNESSEE

Lincoln Memorial University, Medical Department	Knoxville
University of West Tennessee, Medical Dept.	Memphis, Tenn.

TEXAS

Fort Worth School of Medicine	Fort Worth
Southern Methodist University Medical Department	Dallas

WISCONSIN

Milwaukee Medical College[19]	Milwaukee
Wisconsin College of Physicians and Surgeons[20]	Milwaukee

Note.—Official statements from the following state licensing boards indicate that as a rule the colleges rated in Class C are not recognized:

Alabama
Arkansas (Reg.)
Colorado
Connecticut (Reg.)
Delaware
Indiana
Iowa
Kentucky
Louisiana (Reg.)
Maryland (Reg.)
Michigan
Minnesota
New Hampshire
New Jersey
New Mexico
North Dakota
Ohio
Pennsylvania
Rhode Island
Texas
Vermont
Virginia
West Virginia
Wisconsin

Colleges and States Having Higher Entrance Requirements

The thirty-two medical schools which are now requiring as a minimum for entrance two or more years of work in a college of liberal arts in addition to a four-year high-school education are as follows:

College	Began
Johns Hopkins University, Medical Department	1893
Harvard Medical School	1900
Western Reserve University School of Medicine	1901
University of Chicago, Rush Medical College	1904
University of California, Medical Department	1905
University of Minnesota Medical School	1907
University of North Dakota, College of Medicine	1907
University of Wisconsin, College of Medicine	1907
Cornell University Medical College	1908
Wake Forest College, School of Medicine	1908
Leland Stanford Junior University, Department of Medicine	1909
Yale Medical School	1909
University of Kansas, School of Medicine	1909
University of Michigan, College of Medicine	1909
University of Nebraska, College of Medicine	1909
University of South Dakota, College of Medicine	1909
University of Colorado, School of Medicine	1910
Indiana University School of Medicine	1910
State University of Iowa, College of Medicine	1910
State University of Iowa, College of Homeopathic Medicine	1910
Drake University, College of Medicine	1910
University of Missouri, Department of Medicine	1910
Dartmouth Medical School	1910
Columbia University College of Physicians and Surgeons	1910
Syracuse University College of Medicine	1910
University of Pennsylvania, Medical Department	1910
University of Utah, Medical Department	1910
Northwestern University Medical School	1911
Georgetown University School of Medicine	1912
Washington University Medical School	1912
Ohio-Miami Medical College, Univ. of Cincinnati	1913
University of Pittsburgh, School of Medicine	1913

The following seven medical schools have announced the adoption of the two-year collegiate requirement to take effect in the year given:

University of Georgia, College of Medicine	1914
University of Illinois, College of Medicine	1914
University [illegible] Department	1914
Fordham [illegible] Medicine	1914
University [illegible] of Medicine	1915
College of [illegible] Loma Linda, Cal	1915
Marquette [illegible] of Medicine	1915

The twenty-one following colleges require, in addition to a four-year high-school course, one year of college work in physics, chemistry, biology and a modern language, the requirement beginning in the year given:

College	In Force
Howard University, School of Medicine	1910
Tulane University, School of Medicine	1910
St. Louis University, School of Medicine	1910
University of North Carolina, School of Medicine	1910
University of Oregon, Medical Department	1910
University of Texas, Medical Department	1910
University of Virginia, Department of Medicine	1910
West Virginia University, School of Medicine	1911
Medical School of Maine	1912
University of Michigan, Homeopathic College	1912
University and Bellevue Hospital Medical College	1912
Leonard Medical School	1912
University of Vermont, College of Medicine	1912
University of Illinois, College of Medicine	1913
Cleveland-Pulte Medical College	1913
Hahnemann Medical College, Philadelphia	1913
Jefferson Medical College	1913
Medico-Chirurgical College of Philadelphia	1913
Temple University, [illegible]	1913
Woman's Medical [illegible]	1913
Baylor University, [illegible]	1913

The twenty-one following medical colleges have intimated that, beginning in 1914, they will require for admission, in addition to a standard four-year high-school education, the premedical college year devoted to courses in physics, chemistry, *biology and a modern language:*

College	In Force
College of Physician [illegible] Angeles	1914
Oakland College of [illegible]	1914
George Washington [illegible] Department	1914
Bennett Medical College	1914
College of Physicians and Surgeons, Baltimore	1914
University of Maryland, School of Medicine	1914
Boston University, School of Medicine	1914
Tufts College Medical School	1914
Detroit College of Medicine	1914
University of Mississippi, Medical Department	1914
John A. [illegible] College	1914
Albany [illegible]	1914
Long Is [illegible]	1914
University of Buffalo, Medical Department	1914
Starling-Ohio Medical College	1914
State University of Oklahoma, School of Medicine	1914
Vanderbilt University Medical Department	1914
University of Tennessee, Department of Medicine	1914
Fort Worth School of Medicine	1914
Southern Methodist University, Medical Department	1914
Medical College of Virginia	1914

After Jan. 1, 1914, therefore, there will be seventy-one medical colleges which will have put into effect entrance requirements of at least one year of college work including courses in physics, chemistry, biology and a modern language.

Higher Preliminary Requirements by State Boards

There are now thirteen state medical licensing boards which have adopted preliminary requirements in advance of a four-year high-school education. These are as follows:

State Examining Board of	No. of Years Required.	Affects Students Matriculating.	Affects all Applicants.
North Dakota	2	1907-08	1911
Iowa	2	1907-08	1911
Minnesota	2	1908-09	1912
Colorado	2	1910-11	1914
Connecticut	1	1910-11	1914
Kansas	1	1910-11	1914
Indiana	2	1910-11	1914
Utah	1	1910-11	1914
South Dakota	2	1911-12	1915
Vermont	1	1912-13	1916
Pennsylvania	1	1913-14	1917
Kentucky	2	1914-15	1918
California	1	1914-15	1918

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[15] Reported not in good standing by the Missouri State Board of Health.

[16] This college will close when the senior class now enrolled has been graduated.

[17] Not included among fully registered colleges in the list issued by the New York Education Department, October, 1912. Reported suspended same year.

[18] Merged with the *University of Oregon Medical Department* at Portland.

[19] This college was closed *in December, 1912, and its property* leased to Marquette University.

[20] In December, 1912, the property of this school was transferred to Marquette University, which is developing a new school of medicine.

The Association of American Medical Colleges

The requirements for admission to and graduation from colleges holding membership in this association are as follows:

SECTION 1.—Every college holding membership in this Association shall, on and after Jan. 1, 1912, require for matriculation a completed or unconditioned medical student's certificate, to be granted by a state medical examining and licensing board, or a board empowered by statute to grant such certificates, or a certificate of entrance to the academic department of any state university, or a certificate of entrance to an accredited university or college, providing that said certificate is granted on no less than the following requirements:

(*a*) A bachelor's degree from an accredited college or university.

(*b*) A diploma and transcript of record from a fully accredited high school, normal school or academy requiring for admission evidence of the completion of a standard course in primary and intermediate grades, and for graduation, the completion of a standard four-year high-school course, embracing two years (2 units) of mathematics, two years (2 units) of English, two years (2 units) of one foreign language, one year (1 unit) of American history and civics, and seven years (7 units) of further credit in language, literature, history or science, making the total of units at least fourteen; *and in addition, one year each of physics, chemistry and biology of college grade of each not less than six semester hours.*

(*c*) An examination in the following branches totalling 14 units:

(A) Required, 7 units.	Units.
Mathematics (minimum 2 years, maximum 3 years), algebra and plane geometry	2
English (minimum 2 years, maximum 4 years)	2
One foreign language (minimum 2 years, maximum 4 years)	2
History (U. S.) and civics	1
Total number of required units	7

(B) Elective, 7 units.
To be selected from the following:

	Units.
English language and literature (in addition to the required work)	1 *to* 2
Foreign languages, additional, Latin, German, Italian, French, Spanish or Greek (not less than 1 year in any one)	1 to 4
Advanced mathematics, advanced algebra, solid geometry and trigonometry (½ year each)	1
Natural science, chemistry 1 year, physics 1 year, and biology, botany, physiology and zoology (½ to 1 year each)	½ to 2
Earth science, physical geography, geology and agriculture (½ year to 1 year each)	½ to
Astronomy (½ year)	½
Drawing (½ to 1 year)	½ to 1
History, ancient, medieval and modern, and English (1 year each)	1 *to* 3
Economics (½ year)	½
Manual training (1 year)	1
Book-keeping (½ to 1 year)	½ to 1

And in addition one year each of physics, chemistry and biology of college grade, of each not less than 8 semester hours.

One unit in any subject is the equivalent of work in that subject *for four or five periods per week for a year of at least thirty-six weeks*, periods to be not less than forty-five minutes in length. One unit is equivalent to 2 semester credits or 2 points.

THE PRELIMINARY COLLEGE YEAR

At a joint meeting of the committees representing the Association of American Medical Colleges and the Council on Medical Education of the American Medical Association held March 22, 1913, and with the advice of Dr. *Kendric C. Babcock*, Specialist in Higher Education of the United States Bureau of Education, the following requirements were adopted for the preliminary college year:

(*a*) The preliminary college year shall extend through one college session of at least thirty-two weeks of actual instruction, including final examinations.

(*b*) In excellence of teaching and in content, the work of this preliminary college year shall be equal to the work done in the freshman year in standard colleges and universities.

(*c*) This preliminary college year shall include courses in physics, chemistry, biology and German or French, each course to embrace at least eight semester hours of didactic and laboratory work in each subject as shown in the following schedule, provided that a *student* may satisfy the requirement of physics in presenting one unit of high-school physics and completing a half year of college physics which continues *and does* not duplicate the work done in the high school:

SCHEDULE

Subject	Lectures or Recitations Per Week	Laboratory Periods * Per Week	Total Hours Per Semester	Total Semester Hours Per Year
Physics, 1	2	2	4	8
Chemistry, 1	2	2	4	8
Biology, 1	2 *or* 3	2 or 1	4	8
German or French, 2	4 or 3	......	4 or 3	8 or 6
Total	10	6 or 5	16 or 15	32 or 30

* Each laboratory period must extend over at least two hours.

OR, EXPRESSED IN CLASS HOURS:

Subject	Total Hours Lectures, or Recitations	Total Hours Laboratory Work	Total Minimum Hours Didactic and Laboratory
Physics, 1	64	128	192
Chemistry, 1	64	128	192
Biology, 1	64 or 96	128 or 64	192 or 160
German or French, 2	128 or 96	....	128 or 96
Totals	320	384 or 320	704 or 640

(*d*) In *medical* colleges planning to give the work of the preliminary year, provision should be made for full-time expert teachers in the various subjects. Sufficient equipment should be provided to enable the students *to do* the work *intelligently*—in amount such as will compare favorably with the equipment for these courses in *standard* colleges and universities.

(*e*) It should be *remembered that the chief object* of the work of the preliminary college year is to provide the student with a *training* that will enable him to enter more readily and intelligently on the study of the fundamental medical sciences in the medical school.

SEC. 2.—This examination must be conducted by or under the authority of the board of medical examiners of the state in which the college is located, or by a duly authorized examiner of the college entrance *examination board*, or the *authorized examiner of* an accredited university, state or otherwise, or by an examiner whose certificates are accepted by accredited colleges or universities, or by a method approved by the judicial council of this association.

SEC. 3.—The term "accredited" as applied to high schools, academies, colleges and universities means institutions of that type that have been investigated and are accredited by the state *university of their respective states*, by the North Central Association of Colleges and Secondary Schools, the *Association of* Colleges and Preparatory Schools of the Southern States, the Association of Colleges and Preparatory Schools of the Middle States and Maryland, the New England College Entrance Certificate Board, the Association of American Universities and the Association of State Universities, *provided* that such accrediting is based on Article III, Section 1, of this constitution.

SEC. 4.—Colleges in membership in this Association may honor the official credentials *presented* by students from other colleges having the standard requirements maintained by members of this Association, excepting for the fourth year of the course, *but no* member of this Association shall admit a student to advanced *standing* without receiving from the dean, secretary or registrar of such college a direct written communication certifying to the applicant's standing. Credit for time or scholarship cannot be *given beyond that of the college issuing the credentials*, except by mutual agreement between the colleges.

SEC. 5.—*Candidates for* the degree of Doctor of Medicine shall *have attended four courses of* study in four calendar years, each annual course to have been of not less than thirty-two teaching weeks' duration, and at least ten months shall intervene between the beginning of any course and the beginning of the preceding course.

SEC. 6.—No *time* credit shall be given to holders of a Bachelor's degree, but subject credit may be given on satisfactory examination. Four years of residence in a medical college shall be required *of all* candidates for the degree of Doctor of Medicine.

SEC. 7.—A college which gives less than a four years' course of study, but does not graduate students, and is possessed of other *required qualifications*, may be admitted to membership.

SEC. 8.—Each student shall be obliged to attend not less than 80 per cent. of the exercises in every annual course of study for which he seeks *credit*. No student shall be given credit on examination unless he attains a grade of at least 70 per cent. or its equivalent in any other marking system. And no student shall be graduated unless he shall have attained a passing grade in each and all subjects of the required curriculum.

CURRICULUM

SECTION 1.—The entire course of four years shall consist of at least 4,000 hours for each student, and shall be grouped in divisions and subdivided into subjects; each division and subject to be allotted the number of hours as shown in the following schedule:

DIVISION 1.—ANATOMY, 720 Hours (18 per Cent.)

	Hours.	Lect. Rec. Dem.	Lab. Wk.
(a) Gross anatomy (including applied anatomy)	510	120	390
(b) Histologic and microscopic anatomy	135	30	105
(c) Embryology	75	30	45

DIVISION 2.—PHYSIOLOGY AND CHEMISTRY, 600 Hours (15 Per Cent.)

	Hours.	Lect. Rec. Dem.	Lab. Wk.
(a) Inorganic chemistry	180	60	120
(b) Organic chemistry	75	30	45
(c) Physiologic chemistry	104	30	75
(d) Physiology	240	140	100

DIVISION 3.—PATHOLOGY, BACTERIOLOGY AND HYGIENE, 450 Hours (11.25 Per Cent.)

	Hours.	Lect. Rec. Dem.	Lab. Wk.
(a) Bacteriology	135	80	105
(b) Hygiene and general dietetics	45	45	...
(c) Pathology	270	60	210

DIVISION 4.—PHARMACOLOGY, MATERIA MEDICA AND THERAPEUTICS, 240 Hours (6 Per Cent.)

	Hours.	Lect. Rec. Dem.	Lab. Wk.
(a) Pharmacology	105	40	65
(b) Materia medica and pharmacology	80	...	...
(c) Therapeutics	55	...	...

DIVISION 5.—MEDICINE AND MEDICAL SPECIALTIES, 970 Hours (24.25 Per Cent.)

	Hours.	Lect. Rec. Dem.	Lab. Wk.
(a) General medicine (including clinical microscopy)	640	...	...
(b) Pediatrics	150	...	...
(c) Nervous and mental diseases	105	...	...
(d) Jurisprudence, ethics and economics	30	...	...
(e) Dermatology and syphilis	45	...	...

DIVISION 6.—SURGERY AND SURGICAL SPECIALTIES, 720 Hours (18 Per Cent.)

	Hours.	Lect. Rec. Dem.	Lab. Wk.
(a) General surgery	510	...	...
(b) Orthopedic surgery	45	...	...
(c) Genito-urinary diseases	45	...	...
(d) Eye	60	...	...
(e) Ear, nose and throat	60	...	...

DIVISION 7.—OBSTETRICS AND GYNECOLOGY, 300 Hours (7.5 Per Cent.)

	Hours.	Lect. Rec. Dem.	Lab. Wk.
(a) Obstetrics	195	...	...
(b) Gynecology (including some abdominal surgery)	105	...	...

Colleges may reduce the number of hours in any subject not more than 20 per cent. provided that the total number of hours in a division is not reduced. Where the teaching conditions in a college are best subserved, the subject may be, for teaching purposes, transferred from one division to another. When didactic and laboratory hours are specified in any subject, laboratory hours may be substituted for didactic hours.

SEC. 2.—Each medical college in membership in the Association shall print in every annual catalogue or announcement a table of the total number of hours work given in said college, arranged both by subjects and years.

SEC 3.—Each college in membership in this Association shall print annually a list of its students by classes.

MEMBERS OF ASSOCIATION

University of Alabama, School of Medicine.
Leland Stanford Junior University, *Department of Medicine.*
University of California, Medical Department.
University of Southern California, Medical Department.
University of Colorado, School of Medicine.
Yale Medical School.
Georgetown University, School of Medicine.
George Washington University, Department of Medicine.
Howard University, Medical Department.
University of Georgia, College of Medicine.
Northwestern University, Medical School.
Rush Medical College.
University of Illinois, College of Medicine.
Indiana University, School of Medicine.
State University of Iowa, College of Medicine.
University of Kansas, School of Medicine.
University of Louisville, Medical Department.
Tulane University, School of Medicine.
College of Physicians and Surgeons, Baltimore.
Johns Hopkins University, Medical Department.
University of Maryland, School of Medicine.
Medical School of Harvard University.
Tufts College Medical School.
Detroit College of Medicine.
University of Michigan, Department of Medicine and Surgery.
University of Minnesota, Medical School.
University of Mississippi, Medical Department.
St. Louis University, School of Medicine.
University of Missouri, School of Medicine.
Washington University, Medical School.
John A. Creighton Medical College, Medical Department.
University of Nebraska, College of Medicine.
College of Physicians and Surgeons, Columbia University.
Cornell University Medical College.
Syracuse University, College of Medicine.
University and Bellevue Hospital Medical College.
University of Buffalo, Medical Department.
University of North Carolina, Department of Medicine.
Wake Forest College, School of Medicine.
University of North Dakota, College of Medicine.
Ohio-Miami Medical College of the University of Cincinnati.
Starling-Ohio Medical College.
Western Reserve University, School of Medicine.
State University of Oklahoma, School of Medicine.
Hahnemann Medical College and Hospital, Philadelphia.
University of Pennsylvania, Medical Department.
University of the Philippines, College of Medicine and Surgery.
University of Pittsburgh, School of Medicine.
Meharry Medical College.
Vanderbilt University, Medical Department.
University of Texas, Medical Department.
University of Utah, Department of Medicine.
University of Vermont, College of Medicine.
Medical College of Virginia.
University of Wisconsin, College of Medicine.

The secretary-treasurer of the Association is Dr. Fred C. Zapffe, 3431 Lexington Street, Chicago.

STATE BOARD NOTES

New Medical Practice Acts.—New medical practice acts have been recently secured for Alaska, Arizona, California, Georgia, Michigan and Pennsylvania. The new practice act of California provides for a year of collegiate work as the minimum standard of preliminary education for all applicants in 1918 and thereafter. The new law of Georgia does away with three separate sectarian boards, replacing them with a single board having on it representatives of all the "schools" of medicine. The new practice act of Pennsylvania requires a year of college work in physics, chemistry and biology in addition to a four-year high-school education, and also requires that before he is eligible to take the license examination the graduate must have served an internship in an approved hospital.

Class C Colleges not Recognized.—At a recent meeting, the New Mexico State Board of Medical Examiners adopted a resolution that hereafter colleges rated in Class C by the Council on Medical Education will not be considered in good standing with that board. This makes twenty-five state boards which have adopted such measures.

New Federation of State Medical Boards.—The organization of a new Federation of State Medical Boards was completed last February and it has a great opportunity for good. A uniformly high but fair standard upheld in all states will make it easier to establish reciprocity between all states. But standards at present are far from uniform and in some states adequate barriers to protect the public against incompetent doctors, quacks and impostors do not exist. To bring about better safeguards against these evils is a very important work. The remarkable improvements made in recent years among medical colleges reveals in stronger contrast the great need of improvements in medical licensure. In no state are the requirements for the license as strict as in the majority of European countries. In no state is the license examination so severe as that of Germany, or that given by the Conjoint Board of England. And no organization is better situated to bring about improvements in medical licensure in this country than is the new Federation of State Medical Boards.

State University Medical Schools

Twenty-seven states now have medical schools as integral parts of the state universities or—in one instance—under state control as separate institutions. These states and other interesting data regarding the medical schools are as follows:

STATE UNIVERSITY MEDICAL SCHOOLS

Medical School of State University of	Only School in State	Length of Med. Course in Years.	Years of College Work for Admission.	Medical School of State University of	Only School in State.	Length of Med. Course in Years.	Years of College Work for Admission.
Alabama	1915	4	..[2]	North Carolina	......	2	1
Arkansas	Yes	4	....	North Dakota	Yes	2	2[3]
California	......	4	2	Oklahoma	Yes	4	....
Colorado	Yes	4	2[3]	Oregon	Yes	4	1
Georgia	......	4	..[1]	South Carolina	Yes	4	....
Illinois	......	4	..[1]	South Dakota	Yes	2	2[3]
Indiana	Yes	4	2[3]	Tennessee	......	4	....
Iowa*	Yes	4	2[3]	Texas	......	4	1
Kansas	Yes	4	2	Utah	Yes	2	2
[illegible]	[illegible]	4	2	Vermont	Yes	4	1
[illegible]	[illegible]	5	2[3]	Virginia	......	4	1
[illegible]	[illegible]	2	....	West Virginia	Yes	2	1
[illegible]	[illegible]	2	....	Wisconsin	......	2	2
Nebraska	......	4	2				

* Have Homeopathic Departments.
1. To require 2 years in 1914.
2. To require 2 years in 1915.
3. Similar requirement by Licensing Board.

In fifteen states no other medical schools exist, medical education in the state being entirely in charge of the state university. This will be true in Alabama also in 1915, when an independent medical school now existing will give only post-graduate instruction.

TABLE 1.—STATISTICS OF MEDICAL COLLEGES IN THE UNITED STATES AND CANADA

Marginal Number.	NAME AND LOCATION OF COLLEGE.	Population of city where college is located. (Census of 1910.)	Classification by Council on Medical Education.	No. of students registered 1912-13.		Graduates 1913.		Grads. with A.B., B.S., or Ph.B.	No. of teachers.	Weeks in college year.	Total Fees (Dollars.)				Executive Officer	Session of 1913-14.		Marginal Number.
				Men.	Women.	Men.	Women.				1st year.	2nd year.	3rd year.	4th year.		Begins 1913.	Ends 1914.	
	ALABAMA			217	...	49	...	6										
1	Birmingham Medical College, Birmingham	132,685	B	102	...	28	...	3	33	31	...	...	105	130	E. P. Hogan, M.D., Secretary	Oct. 1	May 21	1
2	University of Alabama, *School of Medicine*, Mobile	51,521	A	115	...	21	...	3	57	33	150	145	145	145	Eugene D. Bondurant, M.D., Dean	Sept. 22	May 28	2
	ARKANSAS			109	1	32	...	2										
3	University of Arkansas, Medical Department, Little Rock	45,941	B	109	1	32	...	2	51	32	125	125	125	150	Morgan Smith, M.D., Dean	Sept. 15	May 14	3
	CALIFORNIA			389	52	68	4	16										
4	College of Physicians and Surgeons, San Francisco	416,912	C	17	2	3	...	...	39	36	165	160	160	185	Ethan H. Smith, M.D., Dean	Sept. 2	June 4	4
5	Hahnemann Medical College of the Pacific, San Francisco.—H	416,912	B	34	4	15	1	...	35	30	155	100	100	100	*James W. Ward, M.D., Dean*	Aug. 12	April 1	5
6	Leland Stanford Junior Univ., Dept. of Med., San Francisco	416,912	A+	49	4	7	...	7	79	34	160	160	150	150	R. L. Wilbur, M.D., Dean	Sept. 3	May 14	6
7	University of California, Medical Department, San Francisco	416,912	A+	85	19	7	1	7	56	35	165	175	160	160	Herbert C. Moffitt, M.D., Dean	Aug. 18	May 15	7
8	California Eclectic Medical College, Los Angeles.—E	319-198	C	20	...	4	...	...	30	32	145	110	100	125	J. A. Munk, M.D., Dean	Sept. 15	May 21	8
9	College of Physicians and Surgeons Los Angeles	319,198	B	116	9	21	2	2	59	36	160	157	155	182	Charles W. Bryson, M.D., Dean	Sept. 10	June 11	9
10	University of California, Los Angeles Department	319,198	A+	7	...	4	...	...	61	35	...	...	160	160	W. Jarvis Barlow, M.D., Dean	Aug. 22	May 15	10
11	Oakland College of Medicine and Surgery, Oakland	150,174	B	13	...	4	...	...	34	35	210	200	175	175	Edward N. Ewer, M.D., Dean	Aug. 18	June 1	11
12	College of Medical Evangelists, Loma Linda	110	C	48	14	...	...	...	11	36	116	111	111	121	George K. Abbott, M.D., Dean	Sept. 18	June 17	12
	COLORADO			84	6	46	4	12										
13	University of Colorado, School of Medicine, Boulder-Denver	213,381	A	84	6	46	4	12	70	36	75	75	75	75	William P. Harlow, M.D., Dean	Sept. 8	June 3	13
	CONNECTICUT			42	...	9	...	6										
14	Yale Medical School, New Haven	133,605	A+	42	...	9	...	6	59	35	223	155	153	163	George Blumer, M.D., Dean	Sept. 25	June 17	14
	DISTRICT OF COLUMBIA			348	3	59	2	6										
15	George Washington University, Dept. of Medicine, Washington	331,069	A	102	1	10	1	2	72	31	158	159	150	150	W. C. Borden, M.D., Dean	Sept. 24	June 10	15
16	Georgetown University, School of Medicine, Washington	331,069	A	126	...	29	...	3	54	34	165	150	150	150	George M. Kober, M.D., Dean	Sept. 27	June 13	16
17	Howard University, School of Medicine, Washington	331,069	A	120	2	20	1	1	41	32	107	102	102	109	Edward A. Balloch, M.D., Dean	Oct. 1	June 3	17
	GEORGIA			755	8	204	1	7										
18	Atlanta Medical College	154,839	....	....	...	...	...	...	104	32	150	150	150	150	W. S. Elkin, M.D., Dean	Sept. 29	June 1	18
19	Atlanta College of Physicians and Surgeons (a)	154,839	B	338	...	86	...	4	...	...	...	...	...	...	...	...	...	19
20	Atlanta School of Medicine (a)	154,839	B	222	...	35	...	2	...	...	...	...	...	...	...	...	...	20
21	Georgia College of Eclectic Medicine and Surgery, Atlanta.—E	154,839	C	68	2	42	...	...	21	27	80	80	80	105	Elzie B. Thomas, M.D., Dean	Sept. 19	April 18	21
22	Southern College of Medicine and Surgery, Atlanta (b)	154,839	C	47	6	14	1	...	22	27	70	70	70	90	W. B. Lingo, M.D., Dean	Sept. 20	April 20	22
23	University of Georgia, College of Medicine, Augusta	41,040	A	80	...	27	...	1	51	33	140	135	125	150	William H. Doughty, Jr., Dean	Sept. 17	May 27	23
	ILLINOIS			2356	140	552	43	139										
24	Bennett Medical College, *Chicago*	2,185,283	B	382	13	61	5	11	86	35	150	150	125	175	Maximilian Herzog, M.D., Dean	Oct. 1	June 20	24
25	Chicago College of Medicine and Surgery, Chicago	2,185,283	B	609	33	175	13	17	138	31	100	100	100	100	Henry S. Tucker, M.D., Dean	Sept. 20	May 25	25
26	Hahnemann Medical College and *Hospital*, Chicago.—H	2,185,283	B	66	10	27	4	...	70	32	130	125	155	170	W. Henry Wilson, M.D., Dean	Sept. 29	May 28	26
27	Hering Medical College.—H (b)	2,185,283	C	32	7	13	2	1	...	...	...	...	...	...	...	...	...	27
28	Jenner Medical College, Chicago (c)	2,185,283	C	177	14	9	2	...	49	38	140	140	120	125	John D. MacKellar, M.D., Secretary	Sept. 2	June 13	28
29	Northwestern University Medical School, Chicago	2,185,283	A+	196	...	55	1	11	138	33	200	200	191	185	Arthur R. Edwards, M.D., Dean	Sept. 30	June 6	29
30	Rush Medical College (University of Chicago)	2,185,283	A+	391	31	90	5	81	151	34	185	180	180	180	John M. Dodson, M.D., Dean	Oct. 1	June 10	30
31	University of Illinois, College of Medicine, Chicago	2,185,283	A	503	32	122	11	18	133	33	155	155	155	155	William E. Quine, M.D., Dean	Oct. 1	June 9	31
	INDIANA			139	7	46	1	16										
32	Indiana University, School of Medicine, Indianapolis	233,650	A+	139	7	46	1	16	123	36	100	100	130	130	Charles P. Emerson, M.D., Dean	Sept. 25	June 24	32
	IOWA			148	8	41	5	5										
33	Drake University, College of Medicine, Des Moines (d)	86,368	A	40	5	20	4	2	...	...	...	...	...	...	...	...	...	33
34	State University of Iowa, College of Medicine, Iowa City	10.091	A+	96	2	15	1	3	41	36	50	50	50	50	J. R. Guthrie, M.D., Dean, Dubuque	Sept. 22	June 17	34
35	State Univ. of Iowa, Coll. of Homeopathic Medicine, Iowa City.—H	10.091	....	12	1	6	...	...	40	36	50	50	50	60	George Royal, M.D., Dean	Sept. 22	June 17	35
	KANSAS			94	5	28	1	6										
36	Kansas Medical College, Topeka (e)	43,684	B	32	1	21	1	2	...	...	...	...	...	...	...	...	...	36
37	University of Kansas, School of Medicine, Kansas City	82,321	A	62	4	7	...	4	58	35	45	45	100	110	M. T. Sudler, M.D., Asso. Dean	Sept. 17	June 10	37
	KENTUCKY			255	...	77	...	...										
38	University of Louisville, Medical Department, Louisville	223,928	A	255	...	77	...	...	73	32	150	150	150	160	W. Edward Grant, M.D., Dean	Oct. 1	May 29	38
	LOUISIANA			296	...	79	...	23										
39	Tulane University School of Medicine, New Orleans	339,075	A+	296	...	79	...	23	117	32	180	180	180	210	Isadore Dyer, M.D., Dean	Sept. 29	June 3	39
	MAINE			75	...	13	...	4										
40	Medical School of Maine, Portland	58,571	A	75	...	13	...	4	63	33	120	110	110	110	Addison S. Thayer, M.D., Dean	Oct. 16	June 24	40

H., Homeopathic; E., Eclectic.

	MARYLAND			1133	38	240	6	80										
41	Baltimore Medical College, Baltimore (f)	558,185	A	176	...	20	...	...	...	...	...	...	...	...	....	....	....	41
42	College of Physicians and Surgeons, Baltimore	558,185	A	231	...	60	...	1	69	32	105	165	165	105	William F. Lockwood, M.D., Dean	Oct. 1	June 1	42
43	Johns Hopkins University, Medical Department, Baltimore	558,185	A+	317	34	71	5	76	118	33	200	200	200	200	J. Whitridge Williams, M.D., Dean	Oct. 1	June 10	43
44	Maryland Medical College, Baltimore (g)	558,185	C	113	4	31	1	...	...	...	...	...	...	...	....	....	....	44
45	University of Maryland, School of Medicine, Baltimore	558,185	A	203	...	40	...	3	135	32	170	170	170	200	R. Dorsey Coale, M.D., Dean	Oct. 1	June 1	45
	MASSACHUSETTS			730	50	166	9	60										
46	Boston University, School of Medicine.—H	670,585	A	80	18	9	2	3	70	32	130	125	125	155	John P. Sutherland, M.D., Dean	Oct. 2	June 3	46
47	College of Physicians and Surgeons, Boston (h)	670,585	C	80	...	19	...	...	26	...	80	100	100	130	T. D. Crothers, M.D., Dean	....	....	47
48	Harvard Medical School, Boston	670,585	A+	285	...	60	...	56	104	35	237	208	200	200	Edward H. Bradford, M.D., Dean	Sept. 22	June 18	48
49	Tufts College Medical School, Boston	670,585	A	285	32	78	7	1	111	33	155	155	155	155	Frederic M. Briggs, M.D., Secretary	Sept. 24	June 1	49
	MICHIGAN			461	20	80	3	32										
50	Detroit College of Medicine, Detroit	465,766	B	197	...	27	...	2	125	35	115	120	100	130	Frank B. Walker, M.D., Secretary	Sept. 24	June 4	50
51	University of Michigan, Dept. of Med. and Surg., Ann Arbor	14,817	A+	206	15	41	1	28	78	35	108	87	102	62	Victor C. Vaughan, M.D., Dean	Sept. 24	June 4	51
52	University of Michigan, Homeopathic College, Ann Arbor.—H	14,817	A	58	5	12	2	2	21	35	108	87	102	62	W. B. Hinsdale, M.D., Dean	Sept. 30	June 25	52
	MINNESOTA			168	10	41	4	35										
53	University of Minnesota, Medical School, Minneapolis	301,408	A+	166	10	41	4	35	86	35	150	150	150	150	E. P. Lyon, M.D., Dean	Sept. 17	June 11	53
	MISSISSIPPI			38	...	...	...	...										
54	University of Mississippi, Medical Department, Oxford	2,014	A	38	...	...	...	...	13	34	107	100	...	...	W. S. Leathers, M.D., Dean	Sept. 18	June 2	54
	MISSOURI			764	26	220	6	7										
55	University of Missouri, School of Medicine, Columbia	9,662	A+	44	1	...	...	...	15	34	60	60	...	...	Address correspondence to The Dean	Sept. 18	June 4	55
56	Kansas City Hahnemann Medical College, Kansas City.—H	248,381	C	58	...	40	...	1	...	...	...	...	...	...	M. T. Runnels, M.D., Dean	Sept. 8	May 21	56
57	University Medical College, Kansas City (i)	248,381	B	58	...	19	...	1	...	...	...	...	...	...	....	....	....	57
58	Eclectic Medical University, Kansas City (j)	248,381	C	42	...	13	...	...	39	31	100	100	100	100	D. R. Alexander, M.D.	Sept. 4	May 19	58
59	Ensworth Medical College, St. Joseph (k)	77,403	C	20	...	7	...	...	27	32	...	...	...	125	T. E. Potter, Secretary	Sept. 1	May 1	59
60	American Medical College, St. Louis	687,029	C	106	15	29	4	...	101	31	110	135	135	135	James Moores Ball, M.D., Dean	Sept. 23	June 6	60
61	St. Louis University, School of Medicine	687,029	A	233	...	69	...	2	110	33	130	130	130	130	A. C. Eycleshymer, M.D., Acting Dean	Oct. 1	June 7	61
62	St. Louis College of Physicians and Surgeons	687,029	C	52	8	18	1	...	16	32	110	105	100	95	E. T. Brand, M.D., Secretary	Sept. 15	May 17	62
63	Washington University Medical School, St. Louis	687,029	A+	66	...	28	...	1	81	31	155	150	150	155	E. L. Opie, M.D., Dean	Sept. 25	June 11	63
	NEBRASKA			279	16	50	6	10										
64	John A. Creighton Medical College, Omaha	124,096	B	178	4	36	3	3	48	32	140	130	130	130	A. L. Muirhead, M.D., Dean	Sept. 1	April 30	64
65	University of Nebraska, College of Medicine, Omaha	124,096	A	71	7	7	2	7	58	35	111	100	100	105	Robert Henry Wolcott, M.D., Dean, Lincoln	Sept. 9	May 29	65
66	Cotner Medical College.—E	43,973	C	30	5	7	1	...	32	34	100	100	100	100	R. L. Hoff, Registrar, Bethany, Neb.	Sept. 9	May 28	66
	NEW HAMPSHIRE			27	...	10	...	3										
67	Dartmouth Medical School, Hanover (l)	2,075	A	27	...	10	...	3	24	34	160	162	125	125	John M. Gile, M.D., Dean	Aug. 5	April 24	67
	NEW YORK			2133	71	446	14	99										
68	Albany Medical College, Albany	100,253	A	239	...	48	...	2	103	32	130	115	120	130	Willis G. Tucker, M.D., Registrar	Sept. 23	May 26	68
69	Columbia University, College of Phys. and Surg., New York	4,766,883	A+	339	...	99	...	57	205	33	255	250	250	275	Samuel W. Lambert, M.D., Dean	Sept. 24	June 3	69
70	Cornell University Medical College, New York City	4,766,883	A+	90	12	16	3	19	145	33	190	195	185	190	J. S. Ferguson, M.D., Secretary	Oct. 1	June 11	70
71	Fordham University, School of Medicine, New York City	4,766,883	B	136	...	31	...	3	63	34	200	200	200	200	William P. Healy, M.D., Dean	Sept. 26	June 10	71
72	Long Island College Hospital, New York City	4,766,883	B	138	...	69	...	...	81	33	210	205	205	200	Joseph H. Raymond, M.D., Dean	Sept. 23	June 1	72
73	New York Homeopathic Medical College and Hospital.—H	4,766,883	A	245	...	45	...	10	85	31	165	160	150	180	Royal S. Copeland, M.D., Dean	Oct. 1	May 29	73
74	New York Medical College and Hospital for Women.—H	4,766,883	C	....	15	...	9	...	56	31	155	150	135	155	Emily C. Charles, M.D., Dean	Oct. 1	May 20	74
75	University and Bellevue Hospital Medical College, New York	4,766,883	A+	352	...	76	...	2	179	34	205	200	200	225	Egbert Le Fevre, M.D., Dean	Sept. 24	June 10	75
76	Syracuse University, College of Medicine, Syracuse	137,249	A+	87	...	21	...	4	71	33	186	186	116	161	John L. Heffron, M.D., Dean	....	....	76
77	University of Buffalo, Medical Department, Buffalo	423,715	A	207	14	41	2	2	90	34	185	180	110	140	Herbert U. Williams, M.D., Dean	Sept. 22	June 5	77
	NORTH CAROLINA			265	1	47	1	8										
78	Leonard Medical School, Raleigh	19,218	C	97	...	22	...	8	14	30	57	57	57	67	Charles F. Meserve, President	Oct. 1	May 14	78
79	University of North Carolina, Medical Department, Chapel Hill	1,149	A	51	...	...	...	...	29	35	115	116	...	...	Isaac Hall Manning, M.D., Dean	Sept. 8	June 3	79
80	North Carolina Medical College, Charlotte	31,014	C	84	1	25	1	...	42	32	107	102	100	130	W. O. Nisbet, M.D., Dean	Oct. 1	June 1	80
81	Wake Forest School of Medicine, Wake Forest	1,443	A	30	...	...	...	...	9	35	102	103	...	...	William Louis Poteat, President	Sept. 2	May 22	81
	NORTH DAKOTA			11	3	...	...	...										
82	University of North Dakota, Medical Department, University	12,478	A	11	3	...	...	...	10	35	50	50	...	...	Harley E. French, M.D., Dean	Sept. 23	June 17	82
	OHIO			654	24	174	7	39										
83	Cleveland College of Physicians and Surgeons, Cleveland (m)	560,663	....	17	...	16	...	...	...	...	...	...	...	...	....	....	....	83
84	Cleveland-Pulte Medical College, Cleveland.—H	560,663	C	75	10	19	4	...	53	33	125	125	125	125	George H. Quay, M.D., Dean	Oct. 1	June 12	84
85	Western Reserve University School of Medicine, Cleveland	560,663	A+	114	...	22	...	21	96	34	162	155	150	155	F. C. Waite, M.D., Secretary	Oct. 2	June 18	85
86	Eclectic Medical College, Cincinnati.—E	363,591	B	82	7	21	2	1	35	32	100	100	100	100	John K. Scudder, M.D., Secretary	Sept. 11	May 11	86
87	Ohio-Miami Medical College of the University of Cincinnati	363,591	A+	77	3	26	...	4	124	34	150	150	150	150	Paul G. Woolley, M.D., Dean	Oct. 1	June 13	87
88	Starling-Ohio Medical College, Columbus	181,511	A	227	4	52	1	13	64	32	150	150	150	150	W. J. Means, M.D., Dean	Sept. 24	May 27	88
89	Toledo Medical College, Toledo	169,497	C	32	...	15	...	...	50	32	137	132	125	125	L. A. Brewer, M.D., Dean	Oct. 1	May 31	89
	OKLAHOMA			28	4	8	1	1										
90	Univ. of Oklahoma, School of Med., Norman and Oklahoma City	64,205	B	28	4	8	1	1	36	30	55	28	100	105	W. J. Jolly, M.D., Dean	Sept. 25	June 11	90
	OREGON			98	8	28	1	5										
91	University of Oregon, Medical Department, Portland	207,214	A	50	7	18	1	4	60	34	155	150	150	150	K. A. J. Mackenzie, M.D., Dean	Oct. 1	June 15	91
92	Willamette University, Medical Department, Salem (n)	14,094	C	48	1	10	...	1	...	...	...	...	...	...	....	....	....	92
	PENNSYLVANIA			1536	104	377	25	73										
93	Hahnemann Medical College and Hospital, Philadelphia.—H	1,549,008	A	92	...	31	...	4	88	33	180	180	180	180	William B. Van Lennep, M.D., Dean	Sept. 22	June 4	93
94	Jefferson Medical College, Philadelphia	1,549,008	A	680	...	126	...	17	156	34	180	180	180	180	Ross V. Patterson, M.D., Sub-Dean	Sept. 24	June 6	94
95	Medico-Chirurgical College of Philadelphia	1,549,008	A	314	...	64	...	...	112	34	157	150	156	153	Seneca Egbert, M.D., Dean	Sept. 22	June 5	95
96	Temple University, Medical Department, Philadelphia	1,549,008	B	58	11	12	1	2	97	34	150	150	150	150	Frank C. Hammond, M.D., Dean	Sept. 18	June 6	96
97	University of Pennsylvania, Department of Medicine, Philadelphia	1,549,008	A+	307	...	100	...	42	173	35	229	212	210	211	William Pepper, M.D., Dean	Sept. 26	June 17	97
98	Woman's Medical College of Pennsylvania, Philadelphia	1,549,008	A	....	93	...	24	4	60	34	187	181	179	180	Clara Marshall, M.D., Dean	Sept. 17	June 3	98
99	University of Pittsburgh, Medical Department, Pittsburgh	533,905	A	145	...	44	...	4	98	34	235	220	220	225	Thomas S. Arbuthnot, M.D., Dean	Sept. 29	June 17	99

TABLE 1.—STATISTICS OF MEDICAL COLLEGES IN THE UNITED STATES AND CANADA.—(*Concluded.*)

Marginal Number.	NAME AND LOCATION OF COLLEGE.	Population of city where college is located. (Census of 1910.)	Classification by Council on Medical Education.	No. of students registered 1912-13.		Graduates 1913.		Grads. with A.B., B.S. or Ph.B.	No. of teachers.	Weeks in college year.	Total Fees (Dollars.)				Executive Officer	Session of 1913-14.		Marginal Number.
				Men.	Women.	Men.	Women.				1st year.	2nd year.	3rd year.	4th year.		Begins 1913.	Ends 1914.	
	SOUTH CAROLINA			118	...	30	...	4										
1	Medical College of South Carolina, Charleston	58,833	B	118	...	30	...	4	11	32	100	100	100	75	Robert Wilson, Jr., M.D., Dean	Oct. 1	June 4	100
	SOUTH DAKOTA			13	...	...	...	...										
101	University of South Dakota, College of Medicine, Vermilion	2,187	A	13	...	...	...	...	9	35	60	60	...	...	Christian P. Lommen, B.S., Dean	Sept. 16	June 11	101
	TENNESSEE			1205	8	314	1	13										
102	Lincoln Memorial University, Medical Department, Knoxville	36,316	C	97	1	19	...	...	36	32	110	105	105	125	Charles P. McNabb, M.D., Dean	Sept. 23	May 20	102
103	Meharry Medical College, Nashville	110,364	A	318	1	88	...	7	28	30	60	60	60	75	George W. Hubbard, M.D., Dean	Sept. 10	April 21	103
104	Vanderbilt University, Medical Department, Nashville	110,364	A	365	...	71	...	10	65	31	150	150	150	175	William L. Dudley, M.D., Dean	Sept. 18	May 12	104
105	University of Tennessee, College of Medicine, Memphis	131,105	B	109	3	36	1	1	90	34	125	125	125	150	Herbert V. Brooks, M.D., Dean	Sept. 22	June 5	105
106	Memphis Hospital Medical College, Memphis (o)	131,105	B	271	...	87	...	...	...	...	...	...	...	...	....	....	....	106
107	University of West Tennessee, Medical Department, Memphis	131,105	C	45	...	13	...	...	18	30	55	55	55	65	M. V. Lynk, M.D., Dean	Sept. 15	May 1	107
	TEXAS			331	13	84	6	9										
108	Fort Worth School of Medicine, Fort Worth	73,312	C	60	...	12	...	...	59	35	114	113	108	125	I. C. Chase, M.D., Dean	Sept. 8	June 4	108
109	University of Texas, Department of Medicine, Galveston	36,981	A+	140	13	39	1	8	27	32	61	31	21	6	William S. Carter, M.D., Dean	Oct. 1	May 30	109
110	Baylor University, College of Medicine, Dallas	92,104	B	67	4	19	2	...	47	32	120	115	115	125	Edward H. Cary, M.D., Dean	Sept. 29	May 28	110
111	Southern Methodist University, Medical Department, Dallas	92,104	C	64	1	14	...	1	37	32	110	105	100	125	John O. McReynolds, M.D., Dean	Oct. 1	May 29	111
	UTAH			21	2	...	...	...										
112	University of Utah, School of Medicine, Salt Lake City	92,777	A	21	2	...	...	...	14	34	55	55	...	...	J. T. Kingsbury, President	Sept. 15	May 29	112
	VERMONT			140	...	37	...	...										
113	University of Vermont, College of Medicine, Burlington	20,468	A	140	...	37	...	...	18	36	140	140	140	165	H. C. Tinkham, M.D., Dean	Sept. 24	June 24	113
	VIRGINIA			507	...	97	...	14										
114	Medical College of Virginia, Richmond	127,628	A	240	...	43	...	4	122	34	164	164	164	194	Stuart McGuire, M.D., Dean	Sept. 16	June 2	114
115	University College of Medicine, Richmond (p)	127,628	A	176	...	40	...	3	...	...	...	...	...	...	....	....	....	115
116	University of Virginia, Department of Medicine, Charlottesville	6,765	A+	91	...	14	...	7	32	36	140	140	140	140	R. H. Whitehead, M.D., Dean	Sept. 11	June 17	116
	WEST VIRGINIA			8	...	...	...	...										
117	West Virginia University, School of Medicine, Morgantown (q)	9,150	B	8	...	...	...	...	9	36	50	50	...	...	John N. Simpson, M.D., Dean	Sept. 15	June 17	117
	WISCONSIN			339	10	75	3	8										
118	Marquette University School of Medicine, Milwaukee (r)	373,857	....	278	5	75	3	8	116	34	165	160	155	155	Louis F. Jermain, M.D., Dean	Oct. 1	June 18	118
119	University of Wisconsin, College of Medicine, Madison (s)	25,531	A+	61	5	...	...	...	24	35	151	151	...	...	Charles R. Bardeen, M.D., Dean	Sept. 25	June 17	119
	PHILIPPINE ISLANDS			63	9	8	...	...										
120	University of the Philippines, College of Med. and Surg., Manila (t)	234,409	....	63	9	8	...	...	62	36	...	...	...	...	W. E. Musgrave, M.D., Dean	July 1	April 2	120
	CANADA			1710	25	303	2	38										
121	Dalhousie University, Faculty of Medicine, Halifax, N. S. (u)	46,619	....	74	4	7	...	3	29	32	100	100	100	100	A. W. H. Lindsey, M.D., Dean	Sept. 2	April 30	121
122	Queen's University, Faculty of Medicine, Kingston, Ont. (u)	18,874	....	251	...	40	...	...	39	30	105	105	105	135	J. C. Connell, M.D., Dean	Sept. 15	April 29	122
123	Western University, Faculty of Medicine, London, Ont. (u)	46,300	....	108	...	27	...	1	30	30	100	100	100	100	W. E. Waugh, M.D., Registrar	Sept. 17	May 3	123
124	McGill University, Medical Faculty, Montreal, Que. (u)	470,480	....	365	...	61	...	9	119	33	150	150	150	190	John W. Seane, M.D., Registrar	Oct. 1	June 9	124
125	Montreal School of Medicine and Surgery, Montreal, Que. (u)	470,480	....	180	...	35	...	...	60	33	110	118	126	138	E. P. Lachapelle, M.D., Dean	Oct. 1	June 20	125
126	Laval University, Medical Faculty, Quebec, Que. (u)	78,190	....	66	...	22	...	...	24	34	60	60	60	60	Michael J. Ahern, M.D., Dean	Sept. 1	June 4	126
127	University of Toronto, Medical Faculty, Toronto, Ont. (u)	376,538	....	516	17	81	1	24	173	32	150	150	150	150	A. Primrose, M.D., Secretary	Sept. 20	May 31	127
128	University of Manitoba, Manitoba Medical College, Winnipeg (u)	136,036	....	150	4	27	1	1	54	29	155	150	150	150	H. H. Chown, M.D., Dean	Sept. 24	May 1	128

H., Homeopathic; E., Eclectic

REFERENCES TO TABLE 1.

(a) These two colleges have merged, taking the name of Atlanta Medical College.

(b) This college has been closed.

(c) The Jenner Medical College is reported to be not fully recognized by twenty-nine different state licensing boards.

(d) This college has merged with the State University of Iowa College of Medicine and Surgery.

(e) This college has merged with the University of Kansas School of Medicine.

(f) This college has merged with the University of Maryland School of Medicine.

(g) This college is reported to have closed.

(h) The approximate number of medical students actually attending is given; the college reported 181 "matriculants and applicants" which include also the dental classes. This college is reported as not recognized by the Massachusetts Medical Society.

(i) This college gave only the last two, or clinical years of the medical course. It is reported to have closed.

(j) This college is reported as not recognized by the Missouri State Board of Health and by twenty other state licensing boards.

(k) This college will close next year when the one class still enrolled will be graduated.

(l) Dartmouth Medical School will discontinue teaching the clinical years after the class of 1914 has graduated.

(m) This college merged with Western Reserve University School of Medicine in 1910, with the understanding that all classes then enrolled would receive their degrees from the former college. This year the last class received degrees.

(n) This college has merged with the University of Oregon, Medical Department.

(o) This college has merged with the University of Tennessee, Medical Department.

(p) This college and the Medical College of Virginia have been merged, retaining the name of the latter.

(q) Two years ago this institution was closed as a "College of Medicine" but was later restored as a "School." It is stated there was no intention to discontinue medical teaching.

(r) This is a new medical school, an integral part of Marquette University, formed by purchase of the property of the Wisconsin College of Physicians and Surgeons and by lease of the property of the Milwaukee Medical College, both of these institutions having been closed.

(s) The fees charged by this college are only $80 per year for citizens of the state. Similar reductions are made by the medical schools of the University of Michigan, for residents of that state.

(t) This college is financed by the government and no tuition fees are charged.

(u) All the Canadian medical schools now have a "five-year medical course," but this includes a preliminary year devoted largely to courses in physics, chemistry and biology. It is the equivalent therefore to the courses given by the medical schools in the United States which require for admission one year of collegiate work including the sciences mentioned. On the same basis medical colleges in the United States which require two or more years of collegiate work for admission may be said to require a six-year course, or, if the hospital intern year be added, a seven-year course.

Of the twenty-seven state medical schools, twenty give the complete medical course and grant M.D. degrees while seven give only the first two years of the medical course. Minnesota now requires a five-year course, the fifth year to be spent by the student in a hospital as an intern, or in other recognized clinical work. The universities of Iowa and Michigan have Homeopathic departments. In Iowa the entrance requirements are the same for the two departments but in Michigan, while for the regular department two years of collegiate work are required for entrance, only one year is required for the Homeopathic College; nevertheless, the students of the two colleges are taught together in the work of the first two years.

As may be noted, thirteen of these state university medical schools are now requiring for admission two years of collegiate work. The medical schools of the Universities of Georgia and Illinois have adopted the two-year requirement to become effective in 1914. The medical school of the University of Alabama has announced the two-year requirement to take effect in 1915. As already shown the state schools are supported in this requirement by the state licensing boards in Colorado, Indiana, Iowa, Minnesota, North Dakota and South Dakota. Of the fourteen other state university medical schools eight are still requiring for admission a standard four-year high-school course and six are requiring in addition one year of collegiate work.

The Combined Course in Liberal Arts and Medicine

There are fifty medical schools which announce that arrangements have been made whereby students can secure degrees in both arts and medicine in six or seven years' time. Many have arranged for the B.S. and M.D. degrees in six years, or the A.B. and M.D. degrees in seven years. The list of medical schools follows:

College	*B.S. and M.D.*	*A.B. and M.D.*
University of Alabama, School of Medicine	6	7
Leland Stanford Junior University, Dept. of Med.	..	7
University of California, Medical Department	7	7
College of Physicians and Surgeons, Los Angeles.	6	..
College of Medical Evangelists, Loma Linda*	..	7
University of Colorado, School of Medicine	6	7
Yale Medical School, New Haven	6	7
University of Georgia, School of Medicine	6	..
Bennett Medical College, Chicago	6	..
Chicago College of Medicine and Surgery, Chicago	6	..
College of Physicians and Surgeons, Chicago	6	..
Northwestern University Medical School, Chicago.	6	..
Rush Medical College, Chicago	6	7
Indiana University School of Medicine	6	7
State University of Iowa, College of Medicine	6	7
State University of Iowa, College of Homeopathic Medicine, Iowa City.—H	6	7
University of Kansas, School of Medicine	..	6
University of Louisville, Medical Dept., Louisville	6	..
Tulane University, School of Medicine	..	7
University of Maryland, School of Medicine	..	7
Boston University, School of Medicine.—H	6	..
Tufts College Medical School, Boston	..	7
University of Michigan, Dept. of Med. and Surg.	6	7
University of Michigan, Homeopathic College, Ann Arbor—H	6	7
University of Minnesota Medical School†	7	8
University of Missouri, School of Medicine	..	6
St. Louis University, School of Medicine	6	..
American Medical College, St. Louis	6	..
University of Nebraska, College of Medicine	6	7
Cotner Medical College.—E	6	..
Dartmouth Medical School, Hanover	6 (4)	7
Albany Medical College, Albany	..	7
Columbia University, College of Phys. and Surg.	6	7
Cornell University Medical College, New York City	..	7
Fordham University School of Medicine, New York	6	..
University and Bellevue Hospital Medical College	6	7
Syracuse University, College of Medicine, Syracuse	6	7
University of North Carolina, Med. Dept	6 (4)	..
Wake Forest School of Medicine, Wake Forest	6 (4)	6 (4)
University of North Dakota, Medical Department	..	6 (4)
Cleveland-Pulte Medical College, Cleveland.—H	6	7
Western Reserve University, School of Medicine.	..	7
Ohio-Miami Med. Coll. of the Univ. of Cincinnati	6	7
University of Oklahoma, School of Medicine	6	..
Temple University, Medical Department	..	7
University of Pittsburgh, School of Medicine	6	..
University of South Dakota, College of Medicine.	6	..
University of Texas, Department of Medicine	6	7
University of Utah, School of Medicine	6	..
University of Wisconsin, College of Medicine	6	7

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*This college requires a five-year course in medicine and theology, and the combined arts-medical-theological course is seven years.

†Two years in college and five years in medicine for the B.S. and M.D. degrees; three years in college and five years in medicine for the A.B. and M.D. degrees. The five-year medical course includes the hospital intern year

Proportion of Physicians to Population

State.	Population.	Physicians.	People to Each Physician.
Alabama	2,138,093	2,418	884
Arizona	204,354	247	868
Arkansas	1,574,449	2,596	606
California	2,377,549	4,767	499
Colorado	799,024	1,772	451
Connecticut	1,114,756	1,564	713
Delaware	202,322	246	822
District of Columbia	331,069	1,350	245
Florida	752,619	974	773
Georgia	2,609,121	3,022	863
Idaho	325,594	420	775
Illinois	5,638,591	9,988	565
Indiana	2,700,876	4,984	542
Iowa	2,224,771	3,653	609
Kansas	1,690,949	2,688	625
Kentucky	2,289,905	3,601	636
Louisiana	1,656,388	1,930	858
Maine	742,371	1,176	631
Maryland	1,295,346	1,972	657
Massachusetts	3,366,416	5,648	593
Michigan	2,810,173	4,104	685
Minnesota	2,075,708	2,262	918
Mississippi	1,797,114	6,032	298
Missouri	3,292,335	6,037	546
Montana	376,053	512	734
Nebraska	1,192,214	1,796	664
Nevada	81,875	144	569
New Hampshire	430,572	704	612
New Jersey	2,537,167	2,884	880
New Mexico	327,301	430	761
New York	9,113,614	14,815	615
North Carolina	2,206,287	1,849	1,193
North Dakota	577,056	594	973
Ohio	4,767,121	7,513	635
Oklahoma	1,657,155	2,620	633
Oregon	672,765	1,041	646
Pennsylvania	7,665,111	11,345	676
Rhode Island	542,610	751	723
South Carolina	1,515,400	1,275	1,189
South Dakota	583,888	651	897
Tennessee	2,184,789	3,338	655
Texas	3,896,542	5,888	662
Utah	373,351	427	874
Vermont	355,959	679	524
Virginia	2,061,612	2,359	874
Washington	1,141,990	1,630	701
West Virginia	1,221,119	1,639	745
Wisconsin	2,333,860	2,652	880
Wyoming	145,965	235	621
Army, Navy, P. H. S.	....	968	...
Total	91,972,266	142,190	640

COLLEGE NOTES

Colleges Closed During the Year.—Fourteen medical colleges have been closed during the year. Eight were closed by merger into other medical schools and six became extinct. The colleges are:

Atlanta College of Physicians and Surgeons and the Atlanta School of Medicine merged taking the name of the Atlanta Medical College.

Hering Medical College, Chicago, reported closed.

Drake University College of Medicine, Des Moines, Iowa, merged into the State University of Iowa, College of Medicine.

Kansas Medical College Topeka, merged into the University of Kansas School of Medicine.

Baltimore Medical College, merged with the University of Maryland School of Medicine.

Maryland Medical College, reported closed.

University Medical College, Kansas City, Missouri, reported closed.

Eclectic Medical College of the City of New York, reported closed.

Willamette University Medical Department, Salem, Oregon, merged with the University of Oregon, Medical Department at Portland.

Memphis Hospital Medical College, merged with the University of Tennessee College of Medicine.

University College of Medicine, Richmond, merged with the Medical College of Virginia.

Milwaukee Medical College, closed.

Wisconsin College of Physicians and Surgeons, closed.

TABLE 2.—DISTRIBUTION OF MEDICAL

Marginal Number.	NAME OF COLLEGE	1 Alabama......414	2 Arizona........14	3 Arkansas......200	4 California.....336	5 Colorado......73	6 Connecticut.....204	7 Delaware.......26	8 Dist. of Col.....96	9 Florida.......129	10 Georgia......700	11 Idaho.........29	12 Illinois.......1,314	13 Indiana.......393	14 Iowa.........344	15 Kansas.......326	16 Kentucky......200	17 Louisiana......217	18 Maine.........129	19 Maryland......262	20 Massachusetts..686	Marginal Number.
1	Birmingham Medical College, Birmingham	91								2	1						1	1				1
2	University of Alabama, Medical Dept., Mobile	108								2								1				2
3	University of Arkansas, Medical Dept., Little Rock			91	1											2		1				3
4	College of Phys. and Surgs., San Francisco				8								1	1		2						4
5	Hahnemann Medical College of the Pacific.—H*				38																	5
6	Leland Stanford Junior Univ., Dept. of Med.				40	1											1					6
7	Univ. of California, Med. Dept., San Francisco				97								1								1	7
8	California Eclectic Med. Coll., Los Angeles.—E*				20																	8
9	College of Physicians and Surgeons, Los Angeles		1		26	2	1		1				6	6	13	4	1				3	9
10	University of California, Los Angeles Department				6											1						10
11	Oakland Coll. of Medicine and Surgery, Oakland				13																	11
12	College of Medical Evangelists, Loma Linda		1		11	2			2				1	1	1	1						12
13	Univ. of Colorado, School of Med., Boulder-Denver	2	1	1	2	28	1				1	1	5	2	9	4				1	1	13
14	Yale Medical School, New Haven						27						1								2	14
15	George Washingtton University, Dept. of Med.				2		1		33	1			1	1	1				2	4	1	15
16	Georgetown University, School of Medicine				1	1	7		37				1						2	6	28	16
17	Howard University, School of Med., Washington	4		2			1	1	14	4	5		2				3	2		10	1	17
18	Atlanta College of Phys. and Surgs., Atlanta	36			1					28	197						1	2				18
19	Atlanta School of Medicine, Atlanta	10								16	163							1				19
20	Georgia College of Eclectic Med. and Surg.—E*										70											20
21	Southern College of Med. and Surg., Atlanta*										53											21
22	University of Georgia, Med. Dept., Augusta					1				4	66											22
23	Bennett Medical College, Chicago	1		2			1			3	3		198	11	9	1	2	2	1	1		23
24	Chicago College of Medicine and Surgery, Chicago	10	2	4	4		4			2	1	2	253	51	17	11	4	2		1	10	24
25	Hahnemann Med. Coll. and Hosp., Chicago.—H					1						1	39	5	11	3	1		1		1	25
26	Hering Medical College, Chicago.—H												26	1	1		1					26
27	Jenner Medical College, Chicago	1		2		1							60	4	10	3	4				4	27
28	Northwestern University, Medical School, Chicago			1		2				1		1	78	2	13	8		1			1	28
29	Rush Medical College (Univ. of C[illegible]	3		1	2	1				1	2	3	149	16	24	18	3	3		1		29
30	University of Illinois, College of [illegible]				1	4			1		1	1	266	29	21	12		2			1	30
31	Indiana University, School of M[illegible]			1			1							140								31
32	Drake University, College of Med., Des Moines						1					2			32							32
33	State Univ. of Iowa, College of Med., Iowa City												1		83	1						33
34	State Univ. of Iowa, College of Homeo. Med.—H														9							34
35	Kansas Medical College, Topeka			1												31						35
36	Univ. of Kansas, School of Med., Kansas City	1				1										57						36
37	University of Louisville, Med. Dept., Louisville	3	1		1					4	7		17	55	4	3	80	3				37
38	Tulane University School of Medicine	28		11	2	1				8	12		1	1		1	3	120				38
39	Medical School of Maine, Portland						2												66		2	39
40	Baltimore Medical College, Baltimore	2			1		10	1					1							22	36	40
41	College of Physicians and Surgeons, Baltimore						19			1	1		1							29	18	41
42	Johns Hopkins University, Med. Dept., Baltimore	11		2	12		7	2	2		19		8	8	8	3	10	4	2	53	8	42
43	Maryland Medical College, Baltimore						8				1						1	1		12	7	43
44	University of Maryland, School of Medicine	3		1			5	2	—	5	6							1	1	108	1	44
45	Boston University, School of Medicine.—H				1		1									1			7		47	45
46	College of Physicians and Surgeons, Boston†																				80	46
47	Harvard Medical School, Boston	1			11	5	2			1	2		7	4	7	4	1		14	2	123	47
48	Tufts College Medical School, Boston		1				11				2		1						9		252	48
49	Detroit College of Medicine, Detroit									1				6								49
50	Univ. of Michigan, Dept. of Med. and Surg.	2			1	1					5		5	7	4	2	4				2	50
51	Univ. of Michigan, Homeo. Coll., Ann Arbor.—H								1				2	2			1		1	2	1	51
51	University of Minnesota, Medical School											1	3		2	1						52
53	University of Mississippi, Medical Dept., Oxford																					53
54	University of Missouri, Med. Dept., Columbia				1								1			1						54
55	Kansas City Hahnemann Medical College.—H														2	17						55
56	University Medical College, Kansas City			1											2	22						56
57	Eclectic Medical University, Kansas City†															14						57
58	Ensworth Medical College, St. Joseph			1									1		1	5						58
59	American Medical College, St. Louis	2		2						1		3	48	1	3	6	4					59
60	St. Louis University, School of Medicine		2	1		3	1					2	60	10	10	8	3		1			60
61	St. Louis College of Phys. and Surgs.			2									21	1			2					61
62	Washington University, Medical Dept., St. Louis				1								13	1	2	2						62
63	Creighton Medical College, Omaha		1			5							3		21	6						63
64	University of Nebraska, College of Med., Omaha					1									5	1						64
65	Cotner Medical College.—E*																					65
66	Dartmouth Medical School, Hanover						2												1		10	66
67	Albany Medical College, Albany						1														7	67
68	Columbia Univ., College of Phys. and Surgs.	3		1	2	4	11		1		3	2					1		3	1	6	68
69	Cornell Univ. Medical College, New York City				3		3								2						3	69
70	Fordham Univ., School of Med., New York City						9			1				1							1	70
71	Long Island College Hospital, New York City		1				4						2								3	71
72	New York Homeo. Med. Coll. and Hosp.—H				5		7		1		2			1	1				1			72
73	New York Med. Coll. and Hosp. for Women.—H						1															73
74	Univ. and Bellevue Hosp. Med. Coll., New York				1		9			1			1								3	74
75	Syracuse Univ., College of Medicine, Syracuse							1								1						75
76	University of Buffalo, Medical Dept., Buffalo													1							1	76
77	Leonard Medical School, Raleigh	3							1	6	7						2	1				77
78	Univ. of North Carolina, Med. Dept., Chapel Hill									2												78
79	North Carolina Medical College, Charlotte																					79
80	Wake Forest School of Medicine, Wake Forest																					80
81	University of North Dakota, Medical Dept.														1							81
82	Cleveland-Pulte Medical College, Cleveland.—H*																					82
83	Western Reserve University, School of Medicine	1			1								2	5	1	2	1				1	83
84	Eclectic Medical College, Cincinnati.—E			3	1						1		1	4			4					84
85	Ohio-Miami Med. Coll. of the Univ. of Cincinnati												1	2			12					85
86	Starling-Ohio Medical College, Columbus				1								1	2							1	86
87	Toledo Medical College, Toledo																					87
88	University of Oklahoma, School of Med., Norman												2			4						88
89	University of Oregon, Medical Dept., Portland																				1	89
90	Willamette University, Medical Dept., Salem																					90
91	Hahnamann Medical College and Hospital.—H						1	1														91
91	Hahnmann Medical College and [illegible]					1	16	11		3	7	3	3	4	4	5	8	2	6	2	8	92
93	Medico-Chirurgical College of [illegible]	1			1	1	5	1					2							1		93
94	Temple University, Medical Dep[illegible]						1		1		1			1								94
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	

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* Information showing exact distribution not obtained. † Number of students approximate. H.—Homeopatthic. E.—Eclectic.

	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	
Marginal Number.	Michigan........408	Minnesota......318	Mississippi.....221	Missouri.........562	Montana..........30	Nebraska.........281	Nevada..............4	New Hampshire..54	New Jersey......404	New Mexico.......8	New York.....2,093	North Carolina..485	North Dakota....60	Ohio...............795	Oklahoma.........112	Oregon............122	Pennsylvania.1,375	Rhode Island....80	South Carolina.308	South Dakota...60	Tennessee.......436	Texas..............591	Utah.................61	Vermont............87	Virginia...........448	Washington.....85	West Virginia...191	Wisconsin.........474	Wyoming..........10	Philippines, etc..89	Foreign............562	Totals.........17,015	Marginal Number.
1			1																		1	1									3	102	1
2			3											1																		115	2
3			1	1							1				7							2										110	3
4	1						1				1											1									3	19	4
5																																38	5
6		1									1					1				1			1	1		1			1	1	2	53	6
7		1					1				1																				2	104	7
8																																20	8
9	4	3		7		5		1			10			5			7				1						1	3			14	125	9
10																																7	10
11																																13	11
12	2	1			1	5			1	3	4			1	1	1	2					6				2		1	1		10	62	12
13	2	2		2		4					2			3			4	1			3	3					1				4	90	13
14									3		3			1			1	2						2								42	14
15		2			1	1		1	3		14	3		2			9	1	1						6	1	2	1		2	6	103	15
16	1								6		7			1			7	7			1				1	1	2	1		3	5	126	16
17			1	2					5		3	10	1	3			3	2	9		3	5			12		1				13	122	17
18			13								5	8					1	1	32		5	6					1				1	338	18
19			4	1							2	7					1		10		1			2							4	222	19
20																																70	20
21																																30	21
22		1									1								6												1	80	22
23	23	10	2	13		5			6		14	3	1	5	6		10	2				1	1		1		3	17		20	17	395	23
24	17	20	6	15	3	7			3		31	3	8	21	3	2	22	1	1	3	4	5	5	1	4	5	23	16		7	28	642	24
25	2	1				2							1	2			1	1										2			1	76	25
26				1							1			1														1			6	39	26
27	6	5		1		1			1		11			1			7		1	1	1	1						5			60	191	27
28	3	15		1	3	1				2	2		9	8		3				9	1		5		1	6	1	13	1		4	196	28
29	8	12	1	16	4	7			3		5	1	10	23	1	7	3			11	4	3	11	1	3	10		33		1	7	422	29
30	22	27		7	4	8			1	1	3		2	7	4	1	3	1		10	1	2	2		1	9		52		6	22	535	30
31											1			1	1						1											146	31
32		1		2	1	1										1	1														3	45	32
33		2		3									1							1								1			5	98	33
34		1				1											1											1				13	34
35				1																												33	35
36				7																												66	36
37	1	1	6	2					1			3		1	5	1	4		1		8	16			1	1	20	1	1	1	2	255	37
38			34	8								2	1		8	1			2		1	37						1		3	1	296	38
39								1			1						1							1							1	75	39
40								3	7		30	6		2		1	30	2	4				1	2	3		5	1			22	176	40
41			2						13		9	3		4			29	8				2	7		6	1	46	2			33	234	41
42	1	3	3	8		1		3	11		23	11	2	21	1	7	31	3	6	3	3	4	1	2	19	3	6	6	1	3	3	351	42
43								1	5		8	4		3			20	1	3						8		10			20	4	117	43
44			1	1					12		11	44		1			17	4	31						17		4			3	14	293	44
45						1		4	1		6						2	1	2					3	2						19	98	45
46																																80	46
47		3		4	1	1		4	2		20	1	1	9	1		11	16	1	2	1	3	2	3			2	4		1	8	285	47
48								13			2						1	12						2						1	10	317	48
49	157	1					1				2			6	1																22	197	49
50	107	3		2		3			3		15	1		21		2	12				3	1		1	1	3	2	2			6	221	50
51	28	1									8			9		1	5										1					63	51
52		145		2		1							7	1		1				3						3		5			1	176	52
53			38																													38	53
54				39											2										1							45	54
55				30		2									2							1									1	55	55
56				28		2								1	2																	58	56
57				28																												42	57
58				11											1																	20	58
59		1	3	117		1									8		2				1	4						1			3	211	59
60	3	4		84	1	3					1			5	6		2			2		2			6			9			4	233	60
61			1	26							2				1						1	3										60	61
62	1			42								1										1			1					1		66	62
63	1	13		8	3	103					1		1	2		1	1			2		1				2			3	1	3	182	63
64				1		67								1						1									1			78	64
65						35																										35	65
66	1							8	3															2								27	66
67									3		226						1							1								239	67
68	1	1	4	3		3		1	36	1	212	4		4	1	2	12	1	2			3	2	1	2	1		1			3	339	68
69									9		70			4			2	1		1	1					1					2	102	69
70									7		84			1			3								1					3	25	136	70
71									22		398						1							1	1						5	438	71
72									37		168						5	1			1	1		3				1		1	9	245	72
73									7		21																				16	45	73
74		1		2					59		264			3			1								1			2			4	352	74
75				1					1		72						4					1						1			5	87	75
76	1										207			2			6					1									2	221	76
77			1						1		5	29					3		22						12		1				4	97	77
78									1			51																				54	78
79												76							6						1						2	85	79
80												30																				30	80
81					1								12																			14	81
82														85																		85	82
83	1	1		1	1	1					1			114	2		16				1		2				3	1			2	161	83
84	1			2							3			50	2		7	1			1	1					6	1				89	84
85											1			59			1										4					80	85
86		1									1			208			6									1	7			1	1	231	86
87														32																		32	87
88				1											18							6					1					32	88
89																44										11						57	89
90																38										11						49	90
91				1					15		2			1			66	1				1			2						1	92	91
92	1	3	10	2	3	4		2	57		31	29		26		5	342	5	11		4	1	3	7	6	5	8	3			18	680	92
93				1					21	1	6			3			249		1			1	3				1	3		2	10	314	93
94									3			1					49							1	1						10	69	94
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	

TABLE 2.—DISTRIBUTION OF MEDICAL

Marginal Number.	NAME OF COLLEGE	1 Alabama......414	2 Arizona.........14	3 Arkansas.......200	4 California.......336	5 Colorado.........73	6 Connecticut......204	7 Delaware.........26	8 Dist. of Col.....96	9 Florida..........129	10 Georgia..........700	11 Idaho..........29	12 Illinois.........1,314	13 Indiana..........395	14 Iowa..........344	15 Kansas.........320	16 Kentucky.......200	17 Louisiana.......217	18 Maine..........129	19 Maryland.......262	20 Massachusetts..686	Marginal Number.
95	University of Pennsylvania, Dept. of Medicine....	1	....	....	2	2	1	5	....	1	3	3	2	3	1	4	1	2	....	....	2	95
96	Woman's Medical College of Pennsylvania.......	....	....	1	1	....	2	1	....	....	....	....	....	....	2	1	....	1	2	....	4	96
97	University of Pittsburgh, Med. Dept., Pittsburgh.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	97
98	Medical College of South Carolina, Charleston....	....	....	....	....	....	....	....	....	2	1	....	....	....	....	....	....	....	....	....	....	98
99	Univ. of South Dakota, Coll. of Med., Vermilion.	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	99
100	Lincoln Memorial Univ., Med. Dept., Knoxville..	....	....	....	....	....	....	....	....	1	....	....	1	....	....	....	20	....	....	....	....	100
101	Meharry Medical College, Nashville................	21	....	11	....	....	....	....	....	14	36	....	1	1	....	4	12	12	....	1	....	101
102	Vanderbilt University, Med. Dept., Nashville......	27	2	4	5	2	....	....	....	7	14	....	3	2	1	42	....	8	....	....	....	102
103	University of Tennessee, Coll. of Med., Memphis..	6	....	9	1	1	....	....	....	1	1	....	2	....	....	1	3	6	....	....	....	103
104	Memphis Hospital Medical College, Memphis......	24	....	32	....	....	....	....	....	1	....	....	....	....	....	....	4	20	....	....	....	104
105	Univ. of West Tennessee, Med. Dept., Memphis....	1	....	1	....	....	....	....	....	2	1	....	....	....	....	....	....	1	....	1	....	105
106	Forth Worth School of Medicine, Fort Worth....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	106
107	University of Texas, Dept. of Med., Galveston....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	107
108	Baylor University, College of Medicine, Dallas....	2	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	108
109	Southern Methodist Univ., Med. Dept., Dallas.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	109
110	Univ. of Utah, School of Med., Salt Lake City..	....	....	1	....	....	....	....	....	....	....	2	....	....	1	2	....	....	1	....	....	110
111	Univ. of Vermont, College of Med., Burlington...	....	....	....	....	....	18	....	....	....	....	1	....	....	....	....	....	....	8	....	17	111
112	Medical College of Virginia, Richmond............	....	....	....	2	....	1	....	....	....	....	....	....	1	....	....	....	1	....	1	....	112
113	University College of Medicine, Richmond.........	1	....	....	....	....	....	....	....	2	1	....	....	....	....	....	....	....	....	....	....	113
114	Univ. of Virginia, Dept. of Med., Charlottesville..	2	....	3	....	....	....	....	1	....	4	1	....	....	....	....	....	1	....	3	2	114
115	West Virginia Univ., Coll. of Med., Morgantown.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	115
116	Marquette Univ., School of Medicine, Milwaukee..	....	....	....	....	2	....	....	....	....	....	....	3	1	2	1	....	....	....	....	....	116
117	University of Wisconsin, Coll. of Med., Madison..	....	....	....	....	....	....	....	....	....	....	....	5	....	1	....	1	....	....	....	1	117
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	

* Information showing exact distribution not obtained. † Number of students approximate. H.—Homeopathic. E.—Eclectic.

New Colleges.—The Atlanta Medical College was formed by the merger of the Atlanta College of Physicians and Surgeons with the Atlanta School of Medicine. The Marquette University, Milwaukee, Wis., organized its new School of Medicine by taking over the Wisconsin College of Physicians and Surgeons and the Milwaukee Medical College. The Homeopathic College of the State University of Iowa has been reestablished. In Chicago another "afternoon and evening" medical college has been started called the Chicago Hospital College of Medicine, but, according to an official statement, has not yet secured recognition as being in good standing with the Illinois State Board of Health. At Los Angeles, California, an institution calling itself the Pacific Medical College and Post-Graduate Medical School has been organized but makes a boast of granting credit to practitioners of "drugless therapy" which apparently classifies it among such institutions. At Baltimore a new college was organized, at first called the Eclectic School of Medicine of Milton University. After a short time Milton University is said to have disclaimed any relationship with it, and the name was changed to Eastern University School of Medicine. It has been reported as not recognized by the Maryland State Board of Medical Examiners.

Endowments, New Buildings and Other Incidents Occurring During the Year

Alabama.—The University of Alabama School of Medicine, Mobile, has refused promotion to students who failed to pass all examinations, feeling that students promoted with conditions were doubly handicapped. The action will doubtless have a wholesome effect on the scholarship in that school.

——Birmingham Medical College has transferred all its property to the University of Alabama and will be converted into a graduate school of medicine.

Arkansas.—The University of Arkansas, Medical Department, was granted an appropriation of $36,000 by the legislature for the biennium ending March 31, 1915.

California.—The University of California received $1,000,000 from Mrs. George William Hooper to establish an institute of medical research, in memory of her husband. Another gift of $150,000 was received from John M. Keith for a medical research teaching hospital as a memorial to his wife. Gifts to the amount of $400,000 were also assured to build and equip new departments of the University Hospital. It is proposed to move all four years of the medical course to San Francisco and to place the clinical department on an academic basis. A summer course for graduate students has been established.

——Leland Stanford Junior University College of Medicine dedicated the new Lane Medical Library, Nov. 3, 1912. This is a beautiful structure across the street from the medical college building in which the library was formerly located. Since the transfer of the library to the new building, about $35,000 have been expended in reconstructing the medical building, providing for more laboratories and more space for the out-patient department. A fifth year to be devoted to intern work will be required for the M.D. degree for those entering the session of 1914-15 and thereafter.

——The Los Angeles Medical Department of the University of California has received an appropriation of $45,000 from the State Board of Control of California.

Connecticut.—Yale Medical School received $25,000 from the estate of Cyprian S. Brainerd.

Georgia.—*The new medical building of the University of* Georgia Medical Department of Augusta was dedicated Jan. 29, 1913. A special course in public health is to be offered and special degrees will be granted to those completing the course.

Illinois.—The University of Illinois has again taken over the College of Physicians and Surgeons of Chicago, this time as a gift from the alumni. The legislature voted an appropriation of $200,000 for two years for its development.

——Rush Medical College has voted to make obligatory for all students entering in 1914 and thereafter, the five-year course including a year as intern in an approved hospital or in other special clinical or laboratory work. This course has been optional since 1905.

——Hahnemann Medical College of Chicago announces subscriptions of $66,460 toward a permanent endowment fund.

Indiana.—The Indiana University received $65,000 for the Medical School and the Robert W. Long Memorial Hospital for the next year and $75,000 annually thereafter. Another gift of $25,000 was received from Dr. Robert W. Long for completing and furnishing the hospital bearing his name. The contract for building this hospital was let for $161,000 and the construction is now well under way.

Louisiana.—Tulane University has enlarged its Medical Department, which is now called the "College of Medicine." It comprises the School of Medicine, School of Tropical Medicine and Graduate School of Medicine.

Maryland.—Johns Hopkins Hospital has had several important additions. The Harriet Lane Home for Children erected at a cost of $300,000; the James Buchanan Brady Urologic Clinic from a gift of $200,000 from Mr. Brady, who has since agreed to give $15,000 annually for maintenance; Mr. William A. Marlburg has made a substantial addition to the gift of

Marginal Number.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	Marginal Number.
	Michigan.......408	Minnesota......318	Mississippi.......324	Missouri........562	Montana........30	Nebraska.......281	Nevada..........4	New Hampshire..51	New Jersey......401	New Mexico......8	New York.....2,098	North Carolina.485	North Dakota....60	Ohio...........795	Oklahoma.......112	Oregon.........122	Pennsylvania.1,373	Rhode Island...80	South Carolina.308	South Dakota...60	Tennessee......430	Texas..........594	Utah...........61	Vermont........83	Virginia........448	Washington.....85	West Virginia..191	Wisconsin......474	Wyoming........10	Philippines, etc..89	Foreign........562	Totals......17,015	
95	2	1	3	3	....	5	....	....	17	....	13	21	....	4	....	2	169	1	1	....	1	3	....	....	3	5	2	6		1	10	307	95
96	1	1	....	....	....	....	....	....	9	....	17	2	....	4	....	....	20	....	1	....	....	1	....	1	....	....	....	....	....	....	11	93	96
97	1	....	....	....	....	....	....	....	1	....	....	1	....	2	....	....	139	....	....	....	....	....	....	....	....	....	....	....	....	....	....	145	97
98	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	112	....	....	....	....	....	....	....	....	....	....	....	....	118	98
99	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10	....	....	....	....	....	1	....	....	....	....	....	13	99
100	....	....	1	....	....	....	1	....	....	....	....	8	....	....	....	....	....	....	....	....	60	....	....	....	6	....	....	....	....	....	....	98	100
101	....	....	40	8	....	....	....	....	....	....	....	9	....	3	3	....	....	....	15	....	39	58	....	....	3	....	2	....	....	....	29	322	101
102	....	....	13	13	1	....	....	....	1	....	....	3	....	1	2	....	....	....	7	....	157	46	....	....	2	1	1	....	....	....	....	365	102
103	....	....	16	1	....	....	....	....	....	....	....	1	....	....	3	....	....	....	....	....	55	5	....	....	....	....	....	....	....	....	....	112	103
104	....	....	98	....	....	....	....	....	....	....	....	....	....	....	7	....	....	....	1	....	60	24	....	....	....	....	....	....	....	....	....	271	104
105	....	....	8	....	....	....	....	....	....	....	....	11	....	....	....	....	2	....	3	....	4	5	....	....	4	....	....	....	....	....	1	45	105
106	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	....	....	....	....	....	....	51	....	....	....	....	....	....	....	....	....	60	106
107	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	148	....	....	....	....	....	....	....	....	....	153	107
108	....	....	2	....	....	....	....	....	....	....	....	....	....	....	4	....	....	....	....	....	1	58	....	....	....	....	....	....	....	....	....	71	108
109	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	63	....	....	....	....	....	....	....	....	....	65	109
110	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	15	....	....	....	....	....	....	....	....	23	110
111	....	....	....	....	....	....	....	12	3	....	24	....	....	1	....	....	2	3	....	....	....	1	....	45	2	....	....	1	....	....	2	140	111
112	....	....	....	....	....	....	....	....	3	....	5	37	....	....	....	....	3	....	4	....	3	1	....	....	170	....	6	....	....	1	1	240	112
113	....	....	....	....	....	....	....	....	1	....	....	50	....	3	....	....	1	....	5	....	1	....	....	....	95	....	9	....	....	2	5	176	113
114	....	....	7	....	....	....	....	....	....	....	2	8	....	....	1	....	....	....	7	....	2	....	....	....	42	....	2	1	....	....	2	91	114
115	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	....	....	1	....	8	115
116	8	28	....	1	1	....	....	....	....	....	3	....	3	....	....	....	....	....	....	....	....	3	....	....	....	....	....	220	....	3	4	283	116
117	....	1	....	1	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	54	....	....	....	66	117
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	

$100,000 from him and the other heirs of Charles L. Marlburg to erect a memorial hospital building of fifty-four rooms for private patients.

——Johns Hopkins Medical School has fixed a limit of about ninety students for each class, owing to the limited space and facilities in the various laboratories. Yet the space equipment and facilities are greater than in several other colleges which have not seen any necessity for limitations.

——The University of Maryland School of Medicine received $5,300 from Dr. and Mrs. J. C. Hemmeter toward an endowment fund for the chair of physiology.

Massachusetts.—Harvard Medical School received $50,000 by the will of Abel H. Proctor as an addition to the Ellen Osborn Proctor fund for the study of chronic diseases.

Minnesota.—The University of Minnesota has changed the name of its "College of Medicine" to "Medical School," and the faculty has undergone a complete reorganization.

Missouri.—To Washington University School of Medicine has been given the Pagel collection of books on the history of medicine, comprising 2,500 titles. The new hospital and medical school buildings are rapidly approaching completion.

——St. Louis University School of Medicine is erecting a new three-story addition to its college building at a cost of approximately $10,000, to be occupied by the college office and library and for laboratories for experimental medicine.

New Hampshire.—Dartmouth Medical School has voted to discontinue clinical teaching after the graduation of the class of 1914. This is in recognition that clinical teaching in future will require a larger amount of clinical material than is available at Hanover.

New York.—Albany Medical College has been given a new site near the Albany General Hospital where it is planned to erect a new college building.

——Cornell University Medical College has formed a close affiliation with the New York Hospital. A substantial fund for this purpose was provided by Mr. George F. Baker. Cornell also receives from another donor $1,000 annually for a fellowship in the New York Hospital.

——Columbia University received a gift of $1,566,000 by the will of Mr. George Crocker for a cancer research fund.

——University and Bellevue Hospital Medical College received $25,000 from Mrs. Helen Hartley Jenkins, completing the $100,000 endowment fund for the Marcellus Hartley chair of Medicine.

——Fordham University has completed a new building for its School of Medicine at a cost of $250,000.

Nebraska.—The entire four-year course of the University of Nebraska College of Medicine is to be moved to the new medical building in Omaha.

——The John A. Creighton Medical College has received $1,000 toward the endowment of the medical library and an additional sum of $200 annually for maintenance.

Ohio.—Ohio-Miami Medical College of the University of Cincinnati received $125,000 from Mrs. Mary Emery toward the million dollar endowment for the department of pathology. For the endowment of another chair $80,000 was received from the estate of Dr. Francis Brunning. An endowment fund of $50,000 was also received, to be known as the Julie Fries Levy Endowment, the income of which is to be used to further and disseminate medical knowledge. Plans are being laid to secure the needed funds ($250,000) for the erecting of a new medical college building opposite the new Cincinnati City Hospital. It is intended as a memorial to Dr. Daniel Drake, the father of medicine in Ohio.

Oregon.—The Medical Department of the University of Oregon secured an appropriation of $45,000 from the state legislature.

Pennsylvania.—The University of Pennsylvania is erecting a new surgical building at a cost of approximately $300,000. A gift of $50,000 (source not reported) was received to be used to provide for additional hospital beds. The will of Dr. Louis A. Duhring gives $81,000 to the University and its hospital, the income from which is to be used for a department of cutaneous diseases, for scholarships and research along that line and for free beds for such diseases in the University Hospital.

——Jefferson Hospital received $50,000 (source not mentioned) for free hospital beds. One-tenth of the estate of James F. Hope also was left to Jefferson Hospital. The total value of the estate is said to exceed $100,000.

South Carolina.—The Medical College of the State of South Carolina, Charleston, by legislative enactment was made a state institution and also an appropriation of $10,000 was made. A campaign for additional funds for the medical school resulted in raising from the citizens of Charleston $76,000 in subscriptions in ten days' time.

Tennessee.—Vanderbilt University Medical Department has received a gift of $1,000,000 from Mr. Andrew Carnegie.

Wisconsin.—The University of Wisconsin secured an appropriation for $200,000 for a new medical or physics building, with a certainty that the College of Medicine will be better housed whichever building the money is used for.

TABLE 3.—MEDICAL STUDENTS SHOWN BY CLASSES.

Name of College.	Enrolled During 1912-13.				
	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.	Total.
Birmingham Medical Coll., Birmingham	......	29	27	46	102
Univ. of Alabama, Med. Dept., Mobile..	37	23	20	35	115
Univ. of Ark., Med. Dept., Little Rock..	18	22	28	42	110
College of P. and S., San Francisco....	2	7	6	4	19
Hahnemann Med. Coll. of Pacific.—H*..	......	......	......	16	38
Leland Stanford Junior University, Dept. of Med., San Francisco.........	21	14	8	10	53
University of California, Medical Dept...	58	26	12	8	104
Univ. of California, Los Angeles Dept...	......	......	3	4	7
Cal. Eclec. Med. Coll., Los Angeles.—E*	......	......	......	4	20
College of P. and S., Los Angeles......	32	33	33	27	125
Oakland Coll. of M. and S., Oakland..	2	3	4	4	13
Coll. of Med. Evangelists, Loma Linda.	17	18	20	7	62
Univ. of Colorado, School of Med......	15	9	15	51	90
Yale Medical School, New Haven.......	15	10	8	9	42
George Washington Univ., Dept. of Med.	46	20	26	11	103
Georgetown Univ., School of Med......	7	49	33	37	126
Howard University School of Medicine..	16	31	39	36	122
Atlanta College of P. and S., Aalanta..	65	110	75	88	338
Atlanta School of Medicine, Atlanta....	81	36	64	41	222
Georgia Coll. of Eclec. Med and Surg.*.	......	......	......	42	70
Southern Coll. of M. and S., Atlanta*..	......	......	......	23	53
University of Georgia, College of Med..	13	12	18	37	80
Bennett Medical College, Chicago.......	111	91	98	95	395
Chicago College of Med. and Surg......	163	117	121	241	642
Hahnemann Med. Coll. and Hosp.—H..	15	15	12	34	76
Hering Medical College, Chicago.—H.. .	9	4	4	22	39
Jenner Medical College, Chicago........	111	42	20	18	191
Northwestern Univ. Med. Sch., Chicago.	36	34	68	58	196
Rush Medical College, Chicago..........	109	110	93	110	422
University of Illinois, College of Med...	158	119	114	144	535
Indiana University, School of Medicine..	41	35	23	47	146
Drake Univ., College of Medicine.......	13	3	5	24	45
State University of Iowa, College of Medicine, Iowa City...................	35	30	16	17	98
State University of Iowa, College of Homeo. Med., Iowa City.—H..........	3	4	......	6	13
Kansas Medical College, Tokepa........	5	4	2	22	33
University of Kansas, School of Med...	31	17	11	7	66
Univ. of Louisville, Med. Dept.	57	68	51	79	255
Tulane University, School of Medicine..	70	65	70	91	296
Medical School of Maine, Portland.....	15	26	21	13	75
Baltimore Medical College, Baltimore..	46	58	35	37	176
College of P. and S., Baltimore.......	42	67	49	76	234
Johns Hopkins University, Med. Dept.	89	93	91	78	351
Maryland Medical College, Baltimore...	37	17	17	46	117
Univ. of Maryland, School of Med......	67	67	93	66	293
Boston Univ., School of Med.—H......	42	21	22	13	98
College of P. and S., Boston*..........	20	20	21	19	80
Harvard Medical School................	68	82	74	61	285
Tufts College, Med. School, Boston....	100	84	38	95	317
Detroit Coll. of Medicine, Detroit.......	69	43	54	31	197
University of Michigan, Department of Med. and Surg., Ann Arbor..........	84	51	49	37	221
University of Michigan, Homeopathic College, Ann Arbor..................	9	18	19	17	63
Univ. of Minnesota, Medical School....	50	47	33	46	176
Univ. of Miss., Med. Dept., Oxford.....	18	20	......	......	38
Univ. of Mo., Med. Dept., Columbia....	27	18	......	......	45
Kansas City Hahn. Med. Coll.—H*......	......	......	......	8	55
University Med. College, Kansas City...	......	......	8	50	58
Eclectic Med. Univ., Kansas City*......	......	......	......	13	42
Ensworth Medical College, St. Joseph..	......	......	13	7	20
American Medical College, St. Louis....	79	46	37	49	211
St. Louis Univ., School of Medicine....	58	54	46	75	233
St. Louis College of P. and S..........	......	......	......	19	60
Washington Univ., Med. Dept., St. Louis	5	15	18	28	66
Creighton Medical College, Omaha......	56	48	34	44	182
Univ. of Nebraska, Coll. of Med........	33	23	13	9	78
Cotner Medical College.—E..............	14	8	5	8	35
Dartmouth Medical School, Hanover....	9	2	6	10	27
Albany Medical College, Albany........	78	62	48	51	239
Columbia Univ., College of P. and S..	89	70	76	104	339
Cornell Univ. Med. Coll., New York City	39	24	20	19	102
Fordham Univ., School of Medicine.....	37	37	32	30	136
Long Island Coll. Hosp., New York City	126	116	116	80	438
New York Homeopathic Medical College and Hospital.—H......................	85	60	42	58	245
New York Medical College and Hospital for Women.—H........................	19	10	7	9	45
University and Bellevue Hospital Medical College, New York................	54	132	87	79	352
Syracuse University, College of Med....	32	19	13	23	87
Univ. of Buffalo, Med. Dept., Buffalo..	60	65	51	45	221
Leonard Medical School, Raleigh........	24	25	25	23	97
Univ. of North Carolina, Med. Coll....	28	26	......	......	54
North Carolina Med. Coll., Charlotte...	13	20	23	29	85
Wake Forest School of Medicine........	14	16	......	......	30
Univ. of North Dakota, Medical Dept...	8	6	......	......	14
Cleveland-Pulte Medical College..........	......	......	......	23	85
Western Reserve University, School of Medicine, Cleveland	53	39	28	41	161
Eclectic Med. Coll., Cincinnati.—E......	19	21	20	29	89
Ohio-Miami Medical College of the University of Cincinnati..............	18	19	17	26	80
Starling-Ohio Med. Coll., Columbus....	64	55	58	54	231
Toledo Medical College, Toledo..........	16	6	6	4	32
University of Oklahoma, School of Med., Norman and Oklahoma City..	13	7	3	9	32
Univ. of Oregon, Med. Dept., Portland.	18	11	9	19	57
Willamette Univ., Med. Dept., Salem....	8	13	18	10	49
Hahnemann Med. Coll. and Hosp., Phila.	25	20	16	31	92
Jefferson Medical College, Philadelphia.	213	163	169	135	680
Medico-Chirurgical Coll. of Philadelphia	79	79	83	73	314
Temple Univ., Med. Dept., Philadelphia.	17	17	16	19	69
University of Penn., Dept. of Med......	71	58	76	102	307
Woman's Medical College of Penn......	20	29	19	25	93
University of Pittsburgh, Med. Dept....	38	15	49	43	145
Medical College of South Carolina......	34	27	22	35	118
Univ. of South Dakota, Coll. of Med....	9	4	......	......	13
Lincoln Memorial University Medical Department, Knoxville	34	24	17	23	98
Meharry Medical College, Nashville.....	70	81	77	94	322
Vanderbilt Univ., Med. Dept., Nashville	108	107	78	72	365
Univ. of Tenn., Coll. of Med...........	30	24	21	37	112
Memphis Hosp. Med. Coll., Memphis...	60	69	55	87	271
Univ. of West Tenn., Medical Dept......	10	12	8	15	45
Fort Worth School of Medicine..........	10	16	17	17	60
Univ. of Texas, Med. Dept., Galveston..	56	31	23	43	153
Baylor Univ., Coll. of Med., Dallas.....	9	17	21	24	71
Southern Methodist Univ., Med. Dept....	23	11	16	15	65
University of Utah, School of Medicine.	11	12	......	......	23
University of Vermont, College of Med.	12	47	38	43	140
Medical College of Virginia, Richmond..	62	61	61	56	240
Univ. College of Medicine, Richmond...	60	42	34	40	176
University of Virginia, Dept. of Med....	34	22	21	14	91
West Virginia Univ., School of Med.....	5	3	......	......	8
Marquette University School of Med....	67	72	60	84	283
Univ. of Wisconsin, Coll. of Med........	33	33	......	......	66
Totals	4564	4093	3639	4444	17015

Note.—This table gives for each college, from which the information was obtainable, the number of students enrolled in each of the four classes. The colleges marked with an asterisk (*) either do not publish classified lists of their students in their announcements, or otherwise the information was not obtained. For these colleges the figures given in the fourth-year column show the number graduated. The College of Physicians and Surgeons of Boston reported a list of 181 "matriculants and applicants" which also included dental students. On fairly reliable information it is estimated that about 80 medical students were actually enrolled, or about 20 in each class. Nine colleges gave only the work of the first two years and two colleges, the University Medical College of Kansas City and the Ensworth Medical College, St. Joseph, Mo., gave only the work of the clinical years.

This table is very interesting in the light of the rapid trend toward higher entrance requirements. This table should be studied in connection with the lists of colleges on page 587 which have adopted higher entrance requirements. In every instance where the first year class shows a marked increase the medical college is one which has continued to hold to a four-year high school, or lower, entrance requirement, in face of the sweeping and voluntary movement by medical colleges generally toward the requirement of one or more years of liberal arts' college work for admission. The colleges having the most noticeable increases, given in the order they appear in the list, are the Bennett Medical College, Chicago; the Chicago College of Medicine and Surgery; Jenner Medical College, Chicago; University of Illinois College of Medicine; Tufts College Medical School, Boston; American Medical College, St. Louis; Long Island College Hospital, Brooklyn, and Jefferson Medical College, Philadelphia. On the other hand by examining this table the reader can pick out colleges which began last fall to enforce higher entrance standards. The Atlanta College of Physicians and Surgeons began a more rigid enforcement of the fourteen unit high school standard. Six colleges which began the requirement of one year of collegiate work are Howard University School of Medicine, Washington; Medical School of Maine, Portland; University of Michigan Homeopathic College, Ann Arbor; University and Bellevue Hospital Medical College, New York City; Baylor University College of Medicine, Dallas, and the University of Vermont, College of Medicine, Burlington. Two colleges which began the requirements of two years of college work, are Georgetown University School of Medicine, Washington, D. C., and Washington University School of Medicine, St. Louis. In this connection it is interesting to note on page 587 that thirteen state medical licensing boards have adopted higher standards of preliminary education, and that seven of them, Colorado, Indiana, Iowa, Kentucky, Minnesota, North Dakota and South Dakota, require as a minimum two years of collegiate work.

The five colleges having the largest enrollment are Jefferson Medical College, 680; Chicago College of Medicine and Surgery, 642; University of Illinois, College of Medicine, 535; Long Island College Hospital, 438, and Rush Medical College, 422.

THE JOURNAL OF THE
AMERICAN MEDICAL ASSOCIATION

535 DEARBORN AVENUE . . . CHICAGO, ILL.

Cable Address . . . . "Medic, Chicago"

Subscription price . . . . . Five dollars per annum in advance

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SATURDAY, AUGUST 23, 1913

MEDICAL EDUCATION IN THE UNITED STATES

The tabulated statistics herewith presented (pages 569 to 598) are for the year ending June 30, 1913, and are based on signed reports received directly from the medical colleges or from other reliable sources. We take much pleasure in acknowledging here the courtesy and cooperation of the various officials of the medical colleges which have made the compilation of these complete statistics possible.

STATISTICS OF COLLEGES

Table 1 (pages 590 to 592) gives the colleges in session during 1912-13; the population of the city in which each college is located; the rating given to the college in the third classification of the Council on Medical Education; the number of students, men and women, registered during the year; the number of 1913 graduates, men and women; the number of graduates holding collegiate degrees; the number of teachers for each college; the number of weeks of actual work in the college year; the total fees for each year; the executive officer of the college and the dates of beginning and ending of the next session. The figures in heavy-faced type show the totals by states. Beginning on page 569 are given essential facts concerning all medical colleges, arranged by states.

NUMBER OF MEDICAL STUDENTS

The total number of medical students (matriculants) in the United States for the year ending June 30, 1913, excluding special students, was 17,015, a decrease of 2,771 below 1911, a decrease of 4,511 below 1910 and a decrease of 11,127 below 1904, when the highest number of students was enrolled. In fact, it is the lowest number since THE JOURNAL began compiling these statistics in 1900. Of the total number of students, 15,909 were in attendance at the so-called regular colleges, 850 at the homeopathic, and 256 at the eclectic colleges. The attendance at the regular colleges shows a decrease of 1,368 below that of last year and 2,505 below 1911. In the homeopathic colleges there was an increase of twenty-three above the attendance of 1912, but a decrease of forty below the total for 1911. The eclectic colleges show a decrease of fifty-two below 1912 and a decrease of 177 below 1911.

TABLE 4.—MEDICAL COLLEGE ATTENDANCE

Year.	Regular.	Homeo-pathic.	Eclectic.	Physio-Med.	Nonde-script.	Total.
1880..........	9,776	1,220	830	...	...	11,826
1890..........	13,521	1,164	719	...	...	15,404
1900..........	22,710	1,909	522	...	...	25,171
1901..........	23,846	1,683	664	80	144	26,417
1902..........	24,878	1,617	765	91	150	27,501
1903..........	24,930	1,498	848	149	190	27,615
1904..........	23,662	1,309	1,014	123	234	28,142
1905..........	24,119	1,104	578	114	232	26,147
1906..........	23,116	1,055	644	110	249	25,204
1907..........	22,303	1,039	545	97	292	24,276
1908..........	20,936	891	479	90	206	22,602
1909..........	20,554	899	413	52	227	22,145
1910..........	20,136	867	455	49	19	21,526
1911..........	18,414	890	433	49	...	19,786
1912..........	17,277	827	308	...	...	18,412
1913..........	15,919	850	256	...	...	17,015

NUMBER OF MEDICAL GRADUATES

The total number of graduates for the year ending June 30, 1913, was 3,981, a decrease of 502 below 1912, a decrease of 292 below 1911, and a decrease of 459 below 1910. The total this year is 1,766 less than in 1904, when the largest number were graduated. The percentage of graduates to matriculants was 23.4 this year, as compared with 24.7 in 1912 and 21.6 in 1911.

TABLE 5.—MEDICAL COLLEGE GRADUATES

Year.	Regular.	Homeo-pathic.	Eclectic.	Physio-Med.	Nonde-script.	Total.
1880..........	2,673	380	188	..	..	3,241
1890..........	3,853	380	221	..	..	4,454
1900..........	4,715	413	86	..	..	5,214
1901..........	4,879	387	148	18	12	5,444
1902..........	4,508	836	138	16	11	5,009
1903..........	5,088	420	149	24	17	5,698
1904..........	5,190	371	146	20	20	5,747
1905..........	5,126	276	153	22	23	5,600
1906..........	4,811	286	186	22	29	5,364
1907..........	4,591	225	121	11	32	4,980
1908..........	4,370	215	116	12	28	4,741
1909..........	4,163	209	84	15	44	4,515
1910..........	4,113	183	114	16	14	4,440
1911..........	4,006	152	110	5	..	4,273
1912..........	4,206	185	92	..	..	4,483
1913..........	3,679	209	93	..	..	3,981

The number of graduates from the regular colleges was 3,679, or 527 less than last year, 327 less than in 1911 and 434 less than in 1910. From the homeopathic colleges there were 209 graduates, or twenty-four more than in 1912, fifty-seven more than in 1911 and the same number as in 1909. The eclectic colleges graduated ninety-three, or one more than last year, but seventeen less than in 1911 and twenty-one less than in 1910. Of the 3,981 medical graduates, 753, or 18.9 per cent., were reported to hold also degrees in arts or science, as compared with 17 per cent. last year, 16.5 per cent. in 1911 and 15.3 per cent. in 1910. Of the 3,679 regular school graduates, 732, or about 20 per cent., were reported to have baccalaureate degrees, while of the homeopathic graduates, twenty, or 9.5 per cent., were so reported, and of the eclectic graduates only one (less than 1 per cent.) was reported as holding a degree from a college of liberal arts. As will be noted by referring to Table 12, of the 753 graduates holding baccalaureate degrees, 139—the largest number—came from Illinois colleges, followed by 99 from New York, 80 from Maryland, 73 from Pennsylvania and 60 from Massachusetts. It is expected that in future the percentage of graduates holding collegiate degrees will increase, since a larger number of medical schools are requiring college work for admission.

WOMEN IN MEDICINE

During the past year there were 640 women studying medicine, or thirty-nine less than last year, a decrease of forty below 1911 and a decrease of 367 below 1910. The percentage of all medical students was 3.8, as compared with 3.2 last year. There were 154 women graduates this year, or 3.8 per cent. of all graduates. There has been a very marked decrease in the number of women in medicine since 1910, when there were 907 women students and 157 graduates, and in 1909, when there were 921 women students and 162 graduates. Of all the women matriculants, 138 (21.6 per cent.) were in attendance at the two medical colleges for women, as compared with 143 (21.1 per cent.) in 1912, 134 (19.7 per cent.) in 1911 and 155 (17.1 per cent.) in 1910. The remaining 502 (78.4 per cent.) were matriculated in the fifty-five coeducational colleges. From the two women's colleges, there were thirty-three, or 21.4 per cent., of all women graduates, while 121, or 78.6 per cent., secured their degrees from coeducational colleges.

TABLE 6.—Women in Medicine

Year.	Total women students.	Percentage of all students, both sexes.	Total women graduates.	Percentage of graduates, both sexes.	Women's colleges.	Students.	Percentage of all women students	Graduates.	Percentage of all women graduates.	Co-ed. schools.	Students.	Percentage of all women graduates.	Graduates.	Percentage of all women graduates.
1904	1,129	4.3	244	4.0	3	183	16.2	56	23.0	97	946	83.8	198	77.0
1905	1,073	4.1	219	4.0	3	221	20.6	54	24.5	96	852	79.4	165	75.5
1906	895	3.5	233	4.3	3	189	21.0	33	14.1	90	706	79.0	200	87.9
1907	928	3.8	211	4.2	3	210	22.6	39	18.5	86	718	77.4	172	81.5
1908	835	3.7	185	3.9	3	186	22.3	46	24.9	88	649	77.7	139	75.1
1909	921	4.2	162	3.7	3	169	18.4	33	20.3	91	752	81.6	129	79.7
1910	907	4.2	157	3.5	3	155	17.1	41	26.1	82	752	82.9	116	73.9
1911	680	3.4	159	3.7	2	134	19.7	36	22.6	74	546	80.3	123	77.4
1912	679	3.2	142	3.2	2	143	21.1	32	22.5	64	536	78.9	110	77.5
1913	640	3.8	154	3.8	2	138	21.6	33	21.4	55	502	78.6	121	78.6

NUMBER OF COLLEGES.

Heretofore no exact data were available on which absolute statements could be made regarding the number of medical schools existing in any certain year. The Council on Medical Education has succeeded in collecting reliable data regarding all medical schools from which it was possible to construct the chart appearing on pages 578 to 581 of this issue. By means of this chart the actual number of schools existing in any one year can be positively stated, where heretofore only estimates were possible. Table 7, therefore, allowing of comparisons between the number of colleges existing in recent years, has been revised in accordance with this life chart.

Since June 30, 1912, fourteen colleges (mentioned on page 596) have either suspended or have merged with others, and two new colleges have been organized, leaving 106 medical colleges still existing. The number of colleges is the smallest number since 1880. It was about that time that the movement toward establishing medical colleges for profit became most marked, and the rapid increase in the number of colleges has been paralleled only by the rapid decrease since 1904. There has been a net decrease of *fifty-six colleges since 1906*, when there were 162 colleges. Seventy-nine colleges have been closed by merger or otherwise since 1904, but in the same time twenty-three new colleges were organized, leaving 106 medical colleges which still exist. The regular colleges number *ninety-one*, a decrease of ten since last year. The homeopathic colleges number ten, a decrease of one since last year and the eclectic colleges number five, a decrease of one since last year.

TABLE 7.—Medical Colleges
Revised according to Life Chart, p. 578

Year.	Regular.	Homeopathic.	Eclectic.	Physio-Med.	Nondescript.	Total.
1850.........	44	3	4	1	..	52
1860.........	53	6	4	2	..	65
1870.........	60	8	5	2	..	75
1880.........	76	14	8	2	..	100
1890.........	106	16	9	2	..	133
1900.........	126	22	9	2	1	160
1901.........	125	22	10	2	1	160
1902.........	126	20	9	3	2	160
1903.........	126	20	9	3	2	160
1904.........	127	19	9	3	2	160
1905.........	125	19	9	3	2	158
1906.........	130	19	8	3	2	162
1907.........	127	18	9	3	2	159
1908.........	120	18	9	2	2	151
1909.........	115	15	8	1	1	140
1910.........	109	12	8	1	1	131
1911.........	103	12	7	..	..	122
1912.........	101	11	6	..	..	118
1913.........	91	10	5	..	..	106

FEWER BUT BETTER COLLEGES

Of the seventy-nine medical colleges which have ceased to exist since 1904, forty-seven were closed by merger and thirty-two became extinct. It is noteworthy that this rapid diminution in the number of colleges began following the creation of the Council on Medical Education in 1905, and became more marked following the Council's first classification of medical colleges issued in

TABLE 8.—Colleges Closed Since 1904

Year.	Class A.*		Class B.		Class C.		Totals		Total Closed
	Mgd.	Ext.	Mgd.	Ext.	Mgd.	Ext.	Mgd.	Ext.	
1905.........	8	1	..	..	..	..	8	1	9
1906.........	..	..	..	..	..	..	..	..	..
1907.........	3	..	3	1	..	3	6	4	10
1908.........	2	..	2	..	1	4	5	4	9
1909.........	3	..	2	..	..	7	5	7	12
1910.........	1	..	3	..	3	6	7	6	13
1911.........	..	..	3	..	1	3	4	3	7
1912.........	2	..	..	..	..	3	2	3	5
1913.........	3	..	6	1	1	3	10	4	14
Totals..	22	1	19	2	6	29	47	32	79

* Based on the classifications of medical colleges prepared by the Council on Medical Education.

1907. The largest numbers closing in single years were thirteen in 1910, when the Council's second classification was published, and fourteen last year, when the third classification was made public.

It is interesting to note also that most of the closures of medical schools in Classes A and B were by merger, whereas all but three of the medical schools which became extinct had been rated in Class C.

While the total number of colleges is growing smaller, however, and approaching more nearly the normal supply for this country, it is encouraging to note that the number of high-grade, stronger medical colleges is constantly increasing. In 1904 only four medical colleges were requiring any preliminary education in advance of the usual high-school education; now there are fifty-three[1] requiring one or more years of advance college work and twenty-eight others which begin the higher requirement next year. The colleges have been remarkably improved also in regard to buildings, new laboratories, better equipment, larger hospital facilities and—most important—more and better full-time, salaried instructors.

FURTHER MERGERS NEEDED

Only nineteen cities still exist which have two or more medical schools, and in eight of these mergers are scarcely possible, owing to the fact that the schools differ as to sect or race, leaving eleven cities where mergers are still possible. These cities and the number of colleges in each between which mergers are possible, are as follows: Chicago, 6; New York, 5; Baltimore, 4; St. Louis, 4; Boston, 3; San Francisco, 3; Los Angeles, 2; Washington, 2; Dallas, 2, and Omaha, 2. In 1904 there were twenty-four cities having each from two to eight regular medical schools. More mergers should be brought about.

TABLE 9.—CITIES HAVING TWO OR MORE MEDICAL COLLEGES

City	A+	A	B	C	Total
Chicago	2	1	3	1	7
New York	3	1	2	1	7
Philadelphia	1	4	1	..	6
Baltimore	1	2	..	1	4
Boston	1	2	..	1	4
San Francisco	2	..	1	1	4
St. Louis	1	1	..	2	4
Atlanta	..	..	1	2	3
Washington	..	3*	..	..	3*
Los Angeles	½	..	1	1	2½
Ann Arbor	1	1	..	..	2
Cincinnati	1	..	1	..	2
Cleveland	1	..	..	1	2
Dallas	..	..	1	1	2
Iowa City	1	1	..	..	2
Kansas City	..	..	..	2	2
Memphis	..	..	1	1*	2*
Nashville	..	2*	..	..	2*
Omaha	..	1	1	..	2

* One school for the colored race.

The most famous medical centers in Europe—for example, Berlin, Paris, Vienna—have but one large medical school each, which makes systematic use of all the clinical facilities of its respective city. There is no valid reason why this country should not have equally famous medical centers, but the highest development is prevented by the existence of two or more competing medical schools. For the further improvement not only of undergraduate but also of postgraduate medical instruction in this country, there should be other mergers in the eleven cities named.

LENGTH OF TERMS

The length of term of each college fluctuates somewhat from year to year, but on the whole, during the last twelve years there has been a decided lengthening of college terms. This has reference to the weeks of actual work exclusive of holidays. Only three colleges this year reported sessions shorter than twenty-nine weeks, whereas in 1901, one hundred colleges reported sessions of from twenty-three to twenty-eight weeks. Five colleges claim courses of twenty-nine or thirty weeks of actual work, twenty-nine claim courses of thirty-one or thirty-two weeks, and forty-one, the largest number, claim courses of from thirty-three to thirty-four weeks. Of the 106 colleges now existing, ninety-seven, or 91.5 per cent., now claim to require from thirty-one to thirty-six weeks of actual work, exclusive of holidays, as compared with 85 per cent. in 1912, 76 per cent. in 1910, 42 per cent. in 1904 and only 30 per cent in 1901. The one college claiming a course longer than thirty-six weeks is a night school, but it would require twelve or fourteen years of the usual night-school study, however, to obtain the equivalent of four years of thirty-two weeks each in one of the better day colleges.

TABLE 10.—COLLEGE TERMS

Year.	23 to 26 weeks.		27 to 28 weeks.		29 to 30 weeks.		31 to 32 weeks.		33 to 34 weeks.		35 to 36 weeks.		Over 36 weeks.	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No	%
1901	58	36.5	42	26.4	8	5.0	26	16.4	4	2.5	18	11.3	3	1.9
1902	44	28.4	44	28.4	11	7.1	33	21.3	3	1.9	18	11.6	2	1.3
1903	33	21.4	46	29.9	15	9.7	37	24.0	2	1.3	19	12.4	2	1.3
1904	27	16.3	44	26.5	22	13.3	37	22.3	13	7.8	20	12.0	3	1.8
1905	15	9.4	35	21.8	12	7.5	44	27.5	13	8.1	38	23.8	3	1.9
1906	14	8.7	35	21.7	26	16.1	32	19.9	24	14.9	28	17.4	2	1.3
1907	6	3.7	27	16.8	26	16.1	42	26.1	29	18.0	29	18.0	2	1.3
1908	2	1.3	21	13.8	28	18.4	51	33.6	24	15.8	22	14.5	4	2.6
1909	4	2.3	17	11.6	23	16.4	51	34.9	18	12.3	30	20.5	3	2.0
1910	2	1.5	8	6.0	19	14.3	42	31.5	30	22.6	30	22.6	2	1.5
1911	..	....	6	5.0	16	13.3	37	30.8	32	26.7	28	23.4	1	0.8
1912	1	0.9	1	0.9	11	9.5	34	29.3	37	31.8	31	26.7	1	0.9
1913	..	....	3	2.8	5	4.7	29	27.4	41	38.7	27	25.5	1	0.9

TUITION AND OTHER FEES

Special attention is called in Table 1 to the total amount charged by the various colleges for tuition, matriculation, laboratory and graduation fees per annum for each student. In Table 11 the 106 remaining colleges have been grouped according to the amount of fees charged and according to their classification by the Council on Medical Education in Classes A, B and C. Twenty-three colleges charge fees of $100 or less per year, sixty-five between $100 and $175, and eighteen charge above $175. Of the twenty-three colleges charging $100 or less, twelve, or over half, were listed among Class A (acceptable) colleges[2] by the Council on Medical Education, five were among Class B colleges, and only six of them are found among the Class C colleges. Among the ten Class A colleges having these low fees are the schools of medicine of the state universities of Colorado, Iowa, Mississippi, Missouri, North Dakota, South Dakota, Texas and Utah. On the other hand sixteen colleges listed by the Council in Class C charge fees of from $100 to $175 per year for each student. As shown on page 587 diplomas from Class C colleges are reported as not recognized by twenty-four state licensing boards. It is a question, therefore, why a student should spend his time and money in a low-grade college the diplomas of which are not recognized in many states, when in the same time and with even less money he can attend one of the best equipped colleges the diplomas of which are recognized in all states? Although fifty colleges listed in Class A charge fees ranging from $150 to $275 per year for each student, the actual expense for teaching that student in these colleges amounts to from two, or three to several times those sums.

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[1] See list on page 557.

TABLE 11.—College Fees

Total Fees.	Number of Colleges			
	Class A*	Class B.	Class C.	Total.
$ 50 or less	2	1	..	3
50 to $ 75	8	..	3	11
75 to 100	2	4	3	9
100 to 125	6	4	11	21
125 to 150	12	7	3	22
150 to 175	18	2	2	22
175 to 200	10	2	..	12
200 or above	5	1	..	6
Totals	63	21	22	106

* Based on the latest classification of medical colleges prepared by the Council on Medical Education.

COLLEGES, STUDENTS AND GRADUATES BY STATES

Illinois has heretofore had the largest number of medical colleges, but now the first place is held by New York, where there are ten colleges. Missouri and California each have eight and Illinois and Pennsylvania each have seven colleges. Illinois still has the largest number of students enrolled, having 2,496 matriculants last session, followed by New York with 2,204. Pennsylvania with 1,700, Tennessee with 1,213 and Maryland with 1,171. In regard to the graduates the same relative position obtains.

Table 13 shows the colleges existing last session and their students and graduates grouped according to their rank in the third classification of the Council on Medical Education. As will be noted, there were sixty-eight colleges in Classes A+ and A and 25 each in Classes B and C. It is encouraging to note that over 65 per cent. of all students are enrolled in the 56 per cent. of colleges which are in Class A+ and A and that these colleges turn out over 63 per cent. of all graduates. At the other extreme only 10.2 per cent. of all students and 9.8 per cent. of all graduates are from the 21.2 per cent. of colleges rated in Class C.

TABLE 12.—Colleges, Students and Graduates, by States

State.	Medical Schools	Students.		Graduates.		Graduates with B.S. or A.B.
		Men.	Women.	Men.	Women.	
Alabama	2	217	...	49	...	6
Arkansas	1	109	1	32	...	2
California	8	389	52	68	4	16
Colorado	1	81	6	46	4	12
Connecticut	1	42	...	9	...	6
Dist. of Col.	3	318	3	59	2	6
Georgia	4	755	8	204	1	7
Illinois	7	2,356	140	552	43	139
Indiana	1	139	7	46	1	16
Iowa	2	148	8	41	5	5
Kansas	1	94	5	28	1	6
Kentucky	1	255	...	77	...	...
Louisiana	1	296	...	79	...	23
Maine	1	75	...	13	...	4
Maryland	3	1,133	38	240	6	80
Massachusetts	4	730	50	166	9	60
Michigan	3	461	20	80	3	32
Minnesota	1	166	10	41	4	35
Mississippi	1	28	...	...	...	...
Missouri	8	764	28	220	6	7
Nebraska	3	279	16	50	6	10
New Hampshire	1	27	...	10	...	3
New York	10	2,133	71	446	14	99
North Carolina	4	265	1	47	1	8
North Dakota	1	11	3	...	...	...
Ohio	6	654	24	174	7	39
Oklahoma	1	28	4	8	1	1
Oregon	1	98	8	28	1	5
Pennsylvania	7	1,596	104	377	25	73
South Carolina	1	118	...	80	...	4
South Dakota	1	13	...	...	...	...
Tennessee	5	1,205	8	314	1	18
Texas	4	331	18	84	6	9
Utah	1	21	2	...	...	...
Vermont	1	140	...	37	...	...
Virginia	2	507	...	97	...	14
West Virginia	1	8	...	...	...	...
Wisconsin	2	339	10	75	3	8
Totals	106	16,372	643	3,827	154	753

Table 13.—Statistics According to College Classification

Colleges*			Students		Graduates	
	No.	Per Cent.	Number	Per. Cent.	Number	Per Cent.
Class A+	25	21.2	4,229	24.9	992	24.9
Class A	43	36.4	6,893	40.5	1,547	38.9
Class B	25	21.2	4,158	24.4	1,050	26.4
Class C	25	21.2	1,735	10.2	392	9.8
	118	100.0	17,015	100.0	3,981	100.0

* Includes 12 colleges which will hold no more sessions.

HOME STATES OF MEDICAL STUDENTS

Table 2, on pages 594 to 597, shows from what states the students come who were in attendance at each medical college during the session of 1912-13. The influence of the proximity of the medical school is seen in the fact that states having medical colleges contribute more students in proportion to the population than those which have no colleges. This is shown by the dark zone of figures running diagonally down the page. A comparison of this table with the large tables based in state board examinations,[3] which show the distribution of the alumni of each college, is interesting. The college which has widely distributed alumni usually has a student body from an equally large number of states.

The state furnishing the largest number of students this year was New York, with 2,098. Pennsylvania contributed 1,375 and Illinois 1,314. The next states, in the order of the number of students contributed are: Ohio, 795; Massachusetts, 680; Texas, 594; Missouri,

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3. The Journal A. M. A., May 24, 1913, p 1624.

562, and Tennessee, 436. Four states had less than twenty each, these being Arizona fourteen; Wyoming, ten; New Mexico, eight, and Nevada, four. There were eighty-nine students from Hawaii, Porto Rico and the Philippine Islands, and 562 students from foreign countries.

STUDENTS ENROLLED BY CLASSES

In Table 3, on page 598, the students enrolled in each college are shown by classes. This permits one to see whether the attendance at each college is increasing or decreasing. The total attendance for the first year in all colleges is larger than that of the second year by 471. More interesting, however, is the study of this table in the light of higher entrance requirements which have been adopted during the last two or three years by a large number of colleges.[4] The effects of these higher requirements are shown in the figures in two ways: smaller enrollments for the colleges which have adopted the higher requirements and larger enrollments for the colleges which have retained the lower requirements. The benefit in larger classes for the "stand-pat" colleges can be only temporary, however, so decided is the trend for the higher standards. Already thirteen state licensing boards have gone on record for the higher requirements and others are contemplating similar action. The House of Delegates of the American Medical Association in June, 1912, adopted a report instructing the Council on Medical Education to omit from the acceptable list any medical college which after Jan. 1, 1914, does not require for admission in addition to the four-year high-school education, at least one year of higher preliminary work, including courses of college grade in physics, chemistry and biology. The Association of American Medical Colleges has adopted a similar requirement. The medical profession in the United States, therefore, has gone on record for entrance qualifications which bring medical education in this country more nearly on a par with the requirements of other countries.

The next great wave of improvement, and which has already begun, is the establishing of closer relationships between hospitals and medical schools, whereby each of the hospitals will have on its attending staff the most skilled physicians who are engaged in teaching and research, and the medical school will possess a teaching hospital where students may see and study patients at the bedside. This closer relationship is a direct acknowledgment on the part of the hospital that the medical school has improved to such an extent that it is a real honor and a benefit to have a closer relationship with it. This closer relationship undoubtedly means that the hospitals will be conducted along more modern lines; it means that medical students will be given a better training in the examination and care of patients and, last but not least, it means that the public will in future be supplied with better qualified physicians.

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[4] See lists on page 587.

HASTY GENERALIZATION IN THERAPY

The search for "specifics" for the various ailments that beset mankind has become so keen in recent years, partly because of the striking success in a few familiar instances, and the competition among drug manufacturers to meet these obvious wants has become so brisk, that there is at present an overshadowing danger from a sort of reckless medication which may in the end react unfavorably on the advance of chemotherapy. A few experiments are carried out on animals, often without adequate controls; the observer is inspired with a possibility of the therapeutic application of his hasty findings; the clinic and the patient are drawn into requisition; the healing propaganda is launched; the manufacturer helps it on its way; and not infrequently the nostrum vender reaps an unsuspected harvest in the new land of promised health. Then comes the awakening. The premises are found to be wrong, the experimental evidence inadequate, the clinical observations conflicting or uncertain, and the vaunted cures are dispelled.

We are impelled to illustrate this by reference to a recent instance. There are comparatively few well-founded examples of any profound changes in the chemical composition of the fundamental tissues incident to disease. Many of the perversions of physiologic behavior are functional rather than organic in character. It has long been believed that some of the diseases of the central nervous system, particularly those in which anatomic lesions or alterations are known to occur, are attended by changes in the chemical make-up of the tissue. Owing to the technical difficulties in the analysis of nervous matter, the proof has not easily been furnished. Not long ago Carbone and Pighini[1] asserted that in the brain of individuals dying of progressive paralysis the proportion of one of the brain phosphatids, cephalin, is markedly reduced. This announcement promptly awakened the hope of a corresponding therapy of nervous disease.

Several years ago Franchini[2] attempted to "enrich" tissues in lecithin by the administration of lecithin. He employed the product prepared from egg-yolk and believed that he could actually demonstrate a deposition of this lipoid in the liver. In the case of the brain, however, no evidence of any increase in phosphatids could be discovered as the result of furnishing egg lecithin to the body. Fränkel contends that the human brain does not contain the ordinary lecithin, but a phosphatid of different type—a triaminodiphosphatid which he has named "sahidin." In view of the differences in the results of experimental feeding suggested by the specific peculiarities of the species, Salkowski,[3] the well-known pathologic chemist of Berlin, has been impelled to repeat the experiments on phosphatid administration, using the closely related cephalin in place of lecithin.

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[1] Carbone and Pighini: Biochem. Ztschr., 1912, xlvi, 451.

[2] Franchini. Biochem. Ztschr., 1907, vi, 211.

[3] Salkowski, E.: Ist es möglich, den Gehalt des Gehirns an Phosphatiden zu steigern? Biochem. Ztschr., 1913, li, 407.

The outcome of his trials with animals has been that cephalin—already an article of commerce—is well tolerated and apparently readily absorbed. In contrast with what Franchini reported for lecithin, cephalin was not deposited in the liver, but was said to become stored in the brain. When one examines Salkowski's data critically, however, *they bring little conviction*. The actual increment of phosphatid found by him—and that in only a very limited number of experiments—is so small as almost to fall within the limits of experimental error in such kinds of investigation. Salkowski argues that in a tissue which resists alterations in its chemical make-up as stubbornly as does the brain, the increment of even 5 per cent. of any component—the figure recorded for his cephalin trials—is *noteworthy*. He therefore regards it as probable that cephalin can be introduced into the nervous tissue in this way and suggests that his experiments justify the attempt to employ the otherwise harmless cephalin in progressive paralysis and other cerebral affections.

Despite Salkowski's apologies for the limited number of experiments on which he has based his conclusions, one can already foretell the probable outcome of such a recommendation by a well-known medical investigator. Lecithin- and cephalin-therapy will receive an impetus as yet quite unwarranted by the facts at hand. Skilful advertising will do even more. It is not that we object to the therapeutic trial of promising procedures or chemical compounds, for that is the way in which progress is initiated. But in these days of abundant facility for research one may reasonably expect that the purely empirical mode of clinical investigation will be supplemented, if not replaced, by a scheme of observation based on encouraging evidence when such is procurable. It is, of course, true that exact science grows slowly and that painstaking preliminary experiments are laborious and costly. Yet it is precisely the unsatisfactory outcome of haphazard trials, the unfortunate *exploitation* of inadequately controlled panaceas, the failure of ill-timed and unwarranted medication, that have perhaps done more than anything else to cast an undeserved stigma on the utility of much modern therapeutic research. In the interest of this legitimate and important field of medical investigation, productive of helpful results when conducted on a rational basis, this protest against overhasty generalizations from "preliminary" investigations is made.

COMPARISON OF POLYNEURITIS OF FOWLS WITH HUMAN BERIBERI

It would seem that there can be no doubt that beriberi in man is the result of a too nearly exclusive diet of polished rice, or of other foods lacking in what we may for the present, term a neuritis-preventing substance; such at least are the conclusions justified by the extensive studies of Fraser and Stanton[1] and of Strong and Crowell.[2] It has likewise been proved that polyneuritis of fowls—so-called polyneuritis gallinarum—can be induced by a similar diet. The cause of the two diseases is therefore the same, and abundantly justifies the use of the experimental animal in the search for curative or preventive measures to be applied to the human situation.

In this way we have learned that both meat and potatoes contain a certain, but relatively small, amount of the neuritis-preventing substance; and the immunity from beriberi of those races whose main articles of diet are meat and potato is explained. We have learned, further, that ordinary white bread is quite lacking in antineuritic substance; and thereby light is thrown on the appearance of beriberi on Norwegian sailing ships about 1894, when wheat bread was substituted for rye bread in the dietary. A similar result was reported by Little[3] in respect to the native population of Labrador and Newfoundland which lives almost exclusively on white wheat flour at certain seasons. By experimental methods it has further been shown that probably most leguminous seeds—peas, beans, peanuts, etc.—will be efficacious as an antineuritic adjuvant to restricted dietaries of bread or rice.

Despite the useful comparisons which have been made and the analogies discovered, it now appears from the investigations of the U. S. Army Board for the Study of Tropical Diseases as They Exist in the Philippine Islands[4] that the symptomatology and pathology of polyneuritis gallinarum cannot be regarded as identical with that of beriberi in man. As the Manila investigators, Vedder and Clark, note, there is more similarity than difference between the two diseases. They have never observed any edema in fowls at all comparable to wet beriberi in man, however, and while there are undoubtedly slight changes in the hearts of fowls suffering from polyneuritis, there is none of the hypertrophy which is such a characteristic finding in human beriberi. With respect to the fowls it also appears that the disease is not simply a peripheral neuritis as has generally been supposed; on the contrary, the entire nervous system appears to be affected. The symptoms of the disease in fowls, Vedder and Clark maintain, are not chiefly referable to degeneration of the peripheral nerves. Degeneration occurs before symptoms arise; advanced degeneration may be present accompanied by no symptoms at all; and degeneration of the nerves remains after recovery has occurred.

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[1] Fraser and Stanton: *Studies from the Institute for Medical Research, Federated Malay States*, 1909, No. 10; Lancet, London, 1909, i, 451.

[2] Strong and Crowell: Philippine Jour. Sc., 1912, vii, 271.

[3] Little, John M.: Beriberi Caused by Fine White Flour, The Journal A. M. A., June 29, 1912, p. 2029.

[4] Vedder, E. B., and Clark, E.: A Fifth Contribution to the Etiology of Beriberi, Philippine Jour. Sc., 1911, vii, 423.

THE IRREDUCIBLE MINIMUM OF KIDNEY SUBSTANCE

The liberal surplus of renal tissue which the body possesses for the purposes of urinary secretion is sufficiently emphasized by the absence of any pathologic systemic upsets when an entire kidney is removed, as occasionally happens in surgical experience. One intact remaining kidney can adequately perform the functions of excretion which the metabolism calls for. At what point the limit of safety is reached, that is, how much kidney substance is indispensable for the routine requirements of the organism, is primarily a question for experimental solution. One method has consisted in excising segments of the organ and thus by gradual reduction of the kidney substance determining what is the irreducible minimum of the latter compatible with the continuance of health. Those who have proceeded in this way have placed the limit at not less than one quarter of the renal tissue. Pearce, whose observations are perhaps the most careful of all those based on this method of excision, concluded that the removal of larger amounts, and sometimes of three quarters of the substance, leads to the metabolism condition of starvation.[1] The metabolism in excessive kidney reduction is that of inanition dependent on gastro-intestinal disturbances presumably due to faulty chemical correlation. Apparently toxic substances are eliminated into the intestine. Bradford's reduction experiments even led him so far as to suggest that the kidneys have an influence on general metabolism; for he observed conditions which appeared to him to be due, not to retention of products of normal metabolism, but to an increased tissue disintegration affecting especially the muscles. Subsequent researches have made it appear probable, however, that mere reduction of kidney substance, even to a minimum compatible with life, does not lead to disturbances of metabolic function capable of being utilized in the explanation of uremia.

Nature's method of bringing about a pathologic decrease in the amount of functioning renal tissue is usually far less sudden and certainly less severe than any process of instantaneous surgical excision. The phenomena of disease are more closely imitated by the plan of inducing necrosis by ligation of branches of the renal arteries.[2] When this is carried out, as it has been by Dr. Pilcher[3] in Cleveland, the functional efficiency of the kidney appears in even more favorable light than heretofore. As might be anticipated, ligation of one branch of both renal arteries, that is, approximately half of the blood-supply, does not cause any noticeable disturbance in renal performance. The urine remains practically normal. Shutting off three fourths of the arterial supply results in marked temporary prostration, anorexia and loss of weight, with nitrogen output much greater than the intake. The animals gradually recover, however. On the apparently justified assumption that the ligated areas take no part in urine formation, it is permissible to conclude that one fourth of the kidney is able to secrete urine almost as effectively as the entire kidney area. The urine was practically normal: there was an absence of protein and casts. Cardiac hypertrophy did not occur.

The theory that the kidney furnishes an internal secretion having an important influence on general metabolism has been exploited repeatedly since it was first brought to general notice by Brown-Séquard.[4] There is little to substantiate it at present. Certainly if such a function exists it is not noticeably disturbed by events which exclude the physiologic activity of 75 per cent. of the kidney substance.

Current Comment

CHEMICAL CHANGES PRODUCED IN COW'S MILK BY PASTEURIZATION

It has been stated frequently that pasteurizing milk changes its chemical composition and renders it less digestible and less suitable for infants. The changes which are said to take place are chiefly the precipitation of soluble phosphates, which change produces defective nutrition, and the altered constitution of casein and lactalbumin, which renders pasteurized milk inferior as food. These objections originated at the time when high temperatures were employed for pasteurization, and in the absence of reliable investigations were tacitly applied to modern pasteurization at low temperatures. Rupp[1] publishes a series of experiments to determine the following points: (1) the changes in soluble phosphates of lime and magnesia; (2) the extent of change in the protein, and (3) the change in acidity produced by pasteurization of milk at various temperatures. Pasteurizing milk at 155 F. for thirty minutes did not change the amount of soluble phosphate of lime beyond the limits of experimental error, and the phosphate of magnesia remained unchanged. The albumin content was tested in raw milk and in milk pasteurized at various temperatures for thirty minutes. At 145 F. no albumin coagulated; at 150 F. 5.71 per cent. were insoluble, and at 155 and 160 F., 12.76 and 30.87 per cent., respectively, were insoluble. The coagulability of casein with rennin was tested in similar fashion. When the pasteurization temperature was 131, 140 and 149 F., the casein coagulated more rapidly than in raw milk. Retardation of rennin coagulation commenced at 158. Coagulation consumed twice the time as compared with raw milk at 167. The acidity of the milk was slightly reduced after pasteurization. Rupp concludes that milk pasteurized by the holding process at 145 F. for thirty minutes suffers no appreciable chemical change. The soluble phosphates of lime and magnesia do not become insoluble at 155. The lactalbumin does not coagulate at 145, but begins to become insoluble at 150. The time required for coagulation of casein is slightly reduced in milk pasteurized at temperatures up to 149 F. The results are especially interesting as they dispose of another prejudice against the pasteurization of milk.

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[1] Pearce, R. M. The Influence of the Reduction of Kidney Substance on Nitrogenous Metabolism, Jour. Exper. Med., 1908, x, 632.

[2] MacNider, W. D.: Jour. Med. Research, 1911, xxiv, 425.

[3] Pilcher, J. D.: Excretion of Nitrogen Subsequent to Ligation of Successive Branches of the Renal Arteries, Jour. Biol. Chem., 1913, xiv, 389.

[4] Brown-Séquard: Importance de la sécrétion interne des reins, Arch. de physiol. norm. et path., 1893, v, 778.

[1] Rupp, Philip: Bull. 166, Bureau of Animal Industry.

SUICIDE WITH BICHLORID OF MERCURY

Some weeks ago, considerable publicity was given a case of accidental poisoning from bichlorid of mercury tablets. The case was so "featured" as to lead the public to infer that corrosive sublimate poisoning was not only a sure but also a painless route to the other world. Since this accident, the papers have chronicled, almost daily, cases of suicide in which bichlorid of mercury was the drug used. There is no doubt that many unstable persons who, in fits of depression contemplate suicide, are restrained from taking the fatal step by the dread of the unknown agony they may suffer in committing it. To such, the knowledge of a sure and painless method of death removes the only restraining influence left. It is fitting, then, that the public should be acquainted with the fact that there are few modes of suicide more painful and in which the agony is longer drawn out than that due to the taking of bichlorid of mercury. If this fact were given the same publicity that was accorded the case of accidental poisoning, there is little doubt that the corrosive sublimate method of self-destruction would cease to be the fatal fad it has recently become.

THE ADVERTISING OF LOW-GRADE MEDICAL COLLEGES

There are a number of seriously low-grade colleges which depend for their existence on the ready acceptance of their advertisements by lay newspapers and periodicals and by medical journals. For example, the Chicago Hospital College of Medicine, an "afternoon and evening college," regarding the origin of which comment has previously been made,[1] apparently has had no difficulty in placing its advertisements even though it is reported by the Illinois State Board of Health as "not in good standing" and its diplomas, therefore, do not make the holders eligible to practice medicine in Illinois or the majority of other states. Another example is the Jenner Medical College, whose advertisement has appeared regularly in several Chicago newspapers and in some of the popular periodicals. The advertisement of the latter college includes the statement, "Fully recognized by the Illinois and other state boards of health" notwithstanding the fact that official statements from twenty-nine state licensing boards report this college as not fully recognized. Through shrewd advertisements such institutions as these are enabled to prey on public ignorance, and to profit directly or indirectly by taking the hard-earned money of the "poor boy" whom some of them profess to serve. If there were a dearth of thoroughly equipped medical colleges, or if there were a lack of opportunity for worthy students who are poor in purse to secure a medical education, then there might be some justification for upholding these inferior colleges. But such is not the case. This country still has fully one-third of the world's supply of medical colleges, and among these are now many which in standards, teachers, equipment and clinical facilities compare favorably with any abroad. Furthermore, in several of these thoroughly equipped colleges the student can secure an excellent training in the same time and with even less money than he is required to pay in low-grade institutions. Again, the diploma from the better school entitles the graduate to practice medicine in any state of his choice, while a diploma from the low-grade college is now not recognized in most of the states. A glance at the lists of students enrolled in these inferior colleges shows that a large proportion are foreigners who, doubtless having in mind the unquestionably high standards of medical schools abroad and being unacquainted with the amazing diversity of standards among the medical schools in this country, become an easy prey to the self-laudatory if not actually misleading advertisements of these inferior colleges. It is certainly morally wrong if not an actual crime for a medical institution to entice students to enter a profession for which they may not be fitted educationally or otherwise; even more so if that institution is without adequate equipment. It is doubly wrong to take the hard-earned money of the student of limited means and allow him to spend several years of his life in obtaining a degree which when secured does not qualify him for a license to practice in the majority of the states. This action does the student an injury which may seriously affect his entire life, and the practice is aided and abetted by the newspapers and magazines which are willing to carry the advertisements of such schools. We cannot believe that any self-respecting newspaper editor would accept such advertisements if he were acquainted with the facts. It is about time that some thought be given to the injury to the students who are made the prey of such institutions.

Medical News

ALABAMA

City Hospital for Montgomery.—The Ladies' Infirmary Association of Montgomery has offered to contribute $30,000 toward the erection of a city hospital, asking the city in consideration thereof to donate $2,500 annually toward the maintenance fund.

CALIFORNIA

Personal.—Dr. A. P. O'Brien has been appointed police surgeon of San Francisco, vice Dr. Mahoney, deceased.

State Hospitals Organize.—The executive heads of the hospitals of California met in Los Angeles, July 31, and formed the organization of California hospitals to foster the improvement of hospital management and to promote friendly intercourse among the staffs of the component hospitals. Dr. H. P. Barton was elected president and Dr. D. Gochenaur, San Diego, vice-president.

ILLINOIS

The Fight Against Tuberculosis.—Cass County Association for the Prevention of Tuberculosis was organized at Virginia, July 30, with Drs. Albert R. Lyles, Virginia; John G. Franken, Chandlerville; Jos. M. Swope, Arenzville, and Jas. A. Glenn, Ashland, vice-presidents.——Bids for eight cottages for the tuberculosis department of Oak Forest Infirmary were received by the Cook County Board of Commissioners August 4. The bids varied from $112,800 to $142,984.

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[1] Another Joint-Stock Medical College for Chicago? editorial, The Journal A. M. A., Jan. 13, 1912, p. 122.

Hospital Notes.—At a meeting of the board of trustees of the Watseka Hospital, July 30, A. F. Goodyear was elected president of the board and it was voted to take up the deed of the Larson property on which the hospital is to be erected. A committee was appointed to investigate building plans and have the construction of the hospital carried on as rapidly as possible.——Plans have been executed and contracts are being awarded for a new contagious hospital to be built in Evanston by James A. Patten. Mr. Patten offered to build such a hospital if $100,000 should be subscribed by citizens of the town as an endowment fund. The building is to be four stories in height, the three upper stories being devoted to hospital wards.

Chicago

Coroner's Laboratory Opened.—An analytical laboratory for the coroner's office has been opened in the County Building and work has been commenced by the coroner's chemist, Dr. William D. McNally.

Jury of Women.—The first jury of women ever impanelled in Cook County passed on insane cases at the Detention Hospital Court, August 7. Dr. Clara P. Seippel, assistant city physician, was foreman of the jury and Dr. Anna Dwyer a member.

INDIANA

Hospital Notes.—The Board of State Charities, at its meeting July 29, authorized the erection of the building of a new county infirmary for Fayette County.——The new Elkhart General Hospital, recently completed at a cost of $80,000, was opened for public inspection, July 26-27, and for the reception of patients, July 29. The building is three stories with accommodation for forty-eight patients.——Members of the Masonic Fraternity of Fort Wayne have started a movement for organizing a non-sectarian hospital in that city. The proposition contemplates taking over Hope Hospital, rebuilding it and providing it with an entirely new equipment.——Frances Willard Hospital and Training School has been incorporated at Hammond with a capital stock of $60,000.——The cornerstone of the new St. Francis Hospital, Beech Grove, Indianapolis, was laid by Bishop Chartand, July 16. The hospital is to be conducted by the Sisters of St. Francis, will cost about $200,000 and will accommodate 200 patients.

Personal.—Dr. T. L. Eads of Michigan City was robbed August 9 of a gold watch and $21,000 in mortgage notes.——Dr. G. W. Buckner, a colored physician of Evansville, has been appointed United States Minister to Liberia.——The following physicians of Indianapolis spent the summer abroad in travel and attending the International Medical Congress: Dr. J. F. Barnhill, Dr. W. F. Clevenger, Dr. David Ross, Dr. John Oliver, Dr. H. O. Pantzer, and Dr. A. C. Kimberlin.——Dr. Thomas Kennedy, ex-president of the Indiana State Medical Society, Dr. J. H. Eberwain, and Dr. Charles R. Sowder, who have been seriously ill, have recovered their health.——Dr. B. B. Pettijohn, Indianapolis, after taking examination, has been commissioned in the Medical Reserve Corps of the United States Army.——Dr. Frank W. Foxworthy, Indianapolis, chairman of the program committee, attended the American Life Convention which met in annual session at St. Paul, August 19 to 22.——Dr. C. R. Strickland, Indianapolis; Dr. J. C. Sexton, Rushville, accompanied the Indiana auto manufacturers on their coast trip as staff surgeons.

KENTUCKY

New Milk Station Opened.—A new milk station was opened by the Louisville Babies' Milk Fund Association at the Whittier School at Thirteenth and Maple Streets. Clinics are held each Wednesday afternoon and a trained nurse is on duty between 2 and 3.

Tuberculosis Commission to Employ Nurses.—Four district nurses will be employed by the State Tuberculosis Commission to visit communities which will pay the living expenses of the nurses and to introduce a system of district nursing. Three counties have requested already that nurses be sent there.

MARYLAND

Public Welfare Exhibit.—The public health exhibit of the Medical and Chirurgical Faculty opened for a week on August 11 at the Young Men's Christian Association Building in Frederick. It includes alcohol, tuberculosis, infant mortality, and social and municipal sanitation.

Plans for Psychopathic Ward.—Plans for the psychopathic department to be established at the Springfield Hospital for the Insane were submitted at a meeting of the board of directors, July 30. The new building is to cost about $80 000 and the expense will be met by a bond issue recently authorized by the legislature. It will be built in the form of a cross and will be located between the men's and women's buildings.

Baltimore

Personal.—The following sailed for Bremen, August 12: Drs. J. L. Hooper and Robert Hoffmann of Baltimore, and Drs. Walter Fewkes and John A. Whaling of Washington.——Dr. A. L. Fahrsenfeld has been appointed medical examiner of schools, vice Dr. I. R. Page.

Water Treatment to Prevent Typhoid.—The health authorities are using 3,000 pounds of hypochlorite of lime daily with the view of purifying the drinking water and preventing the prevalence of typhoid fever. A report shows that 99 per cent. of the bacteria in the water last year were killed by the hypochlorite.

MICHIGAN

Building for Physicians.—S. S. Kresge is erecting an eighteen-story building at Park Street and Adams Avenue, Detroit, to cost about $700,000. Fifteen of the eighteen stories of this building are to be devoted to physicians' offices, and the building will be known as the Kresge Medical Building.

Hospital Notes.—St. Mary's Hospital, Detroit, has announced that it can receive no insane persons who are city charges, because of the crowded condition of the institution.——The new service building of Harper Hospital, Detroit, was opened August 4. The building is the center of the unit arranged for the hospital, 147x48 feet, and two stories in height.——The second floor of the new Hudson memorial Hospital is ready to receive patients and will accommodate twenty-two patients. The building when completed will be six stories in height and will accommodate one hundred and fifty patients.——A resolution was endorsed July 29 in the Detroit City Council empowering the Board of Poor Commissioners to acquire sufficient land on which to erect a hospital for the care of the sick poor of the city. The resolution was referred to the committee on health and city hospitals.

MINNESOTA

Plea for Sanatorium.—Drs. J. A. Gates, Kenyon, and M. W. Smith, Red Wing, made pleas before the county commissioners of Goodhue County for an appropriation of $15,000 for the establishment of a tuberculosis sanatorium for Goodhue County.

Sanatorium Notes.—Clay and Becker Counties have arranged to make a joint appropriation of $15,000, which, with a state appropriation of a like amount, will be sufficient for the construction of a new tuberculosis sanatorium with a capacity of thirty patients.——Otter Tail County has completed a sanatorium for tuberculosis at a cost of $40,000 with a sixty acre farm of which forty acres are under cultivation.——It has been decided that Duluth will not attempt any legal opposition to the Mercedes Sanatorium for Incurable Consumptives which Mrs. Julia Wood is planning to start.——The physicians of Goodhue County have launched a publicity campaign for the establishment of a county sanatorium in accordance with the recent act of the legislature.

NEW YORK

Personal.—Dr. William H. Jennings of Wellsville and Dr. J. William White of Fonda have sailed for Europe.

Death of Instrument Manufacturer.—J. M. Taylor, president of the Taylor Instrument Companies of Rochester, N. Y., *died* July 31.

New York City

Personal.—Dr. and Mrs. John P. Campbell, Dr. and Mrs. J. Clarence Sharp, Dr. Thomas R. Killilea and Dr. Francis E. Butler have sailed for Europe.

Cocain Users Sentenced.—Nine persons arrested in a raid recently have been sentenced to terms of imprisonment ranging from one to three months for using cocain. Of these six were women and three men. Ten other persons arrested in the same raid were taken to the Court of Special Sessions on the charge of selling cocain. This raid was a part of the campaign against cocain instituted some time ago by Rev. J. B. Curry of St. James Church.

Antitoxin Supplied Free of Charge.—The Health Department has sent a notice to physicians in Manhattan stating that it is believed that the death-rate from diphtheria can be reduced by the administration of 5,000 units of antitoxin on the first day of the disease. To further this end the department announces that beginning September 1 it will, whenever necessary, between the hours of 9 in the morning and 5 in the afternoon, deliver free of charge to any address in Manhattan antitoxin for the treatment of diphtheria.

The Infant Mortality-Rate.—The Babies' Welfare Association makes itself responsible for the statement that fewer babies in proportion to the population have died in New York City during the past six months than in any other important city in the United States. There were 100 fewer deaths of infants under 1 year of age than during the same period of 1912. Chicago, Philadelphia and Buffalo show a higher death-rate for the first six months of 1913 than for the corresponding period of 1912. The Welfare Committee think that the extreme heat of the present summer has affected the rate in this city unfavorably, especially in the more crowded sections, as might be expected.

Health Department Issues New Publication.—On the first of August the Department of Health sent out its first issue of a periodical for the information of employees of the department called "Staff News." This bulletin will be the official medium of communication of general orders from the board of commissioner, and of instructions issued by the heads of bureaus and divisions. It is hoped to expand this publication and to make it interesting and valuable to employees of the department who now number 3,036 and it is believed that it will be effective in developing a feeling of community of interest among employees and thus improve the service.

Reduction in Death Rate a Campaign Issue.—One of the main arguments of the fusionists for a continuation of anti-Tammany rule is that during the present city administration the infant death rate has been cut from 134 per 1,000 in 1910 to 120 per 1,000 in 1911 and a still further reduction in 1912. They lay great stress on the work of the milk stations, on the increase in their number and on the entire work of the Department of Child Hygiene. When the fusionists came into office this division of the Health Department was receiving a budget allowance of $348,190, while it is now receiving $600,000, but the elimination of graft and waste has more than made up for the increased appropriation to this work. The argument closes with an appeal to voters to continue the anti-Tammany control of the board of estimate and apportionment in behalf of the public health.

Little Italy Fighting Flies.—Under the newly organized Bureau of Public Health and Hygiene of the Association for Improving the Condition of the Poor an interesting experiment is being conducted in the heart of the Italian population of the upper East Side. Through the generosity of Mrs. A. A. Anderson, $2,000 has been put at the disposal of the association in order to eliminate as far as possible all flies from one block. Screens are furnished for all windows in the block and a special inspector from the Department of Health keeps unusually careful watch over the sanitary conditions of that block and the neighboring ones. It is hoped that a comparison of the infant mortality of this block with those in which no such careful elimination of the fly is striven for will prove the part that this pest plays in the high death rate of babies. Fly traps, fly papers and fly swatters are also furnished to the dwellers in this neighborhood and disinfectants to the owners of stables. Accurate statistics are being kept for the block and the results of the experiment will be announced at the end of ten weeks from the initiation of measures against the fly.

OHIO

Salvation Army Opens Dispensary.—A free surgical dispensary has been opened by the Salvation Army in Columbus. Among the members of the staff are Drs. D. G. Sanor, A. C. Miller, Robert Leach and Caspar H. Benson.

Tuberculosis Farm Sold.—The tuberculosis farm purchased by Miami and Darke counties two years ago, for $15,000, on which it has been intended to erect a bi-county tuberculosis hospital (but this was prevented by legal action), was sold recently for $7,300.

PENNSYLVANIA

Automobile Ambulance for Chester Hospital.—The Chester Hospital has received its automobile ambulance, purchased through public subscriptions at a cost of $4,000.

Lectures on Health.—Dr. A. Barr Snively, Waynesboro, chairman of the Franklin County Medical Society committee on health and public instruction, reports that nearly all the schools of the county have been visited by the physicians assigned by the committee. The talks on health have been well received. The talks were on (1) necessity of fresh air; (2) need of cleanliness in person and surroundings; (3) risk of personal contact with the ill, or unhealthy conditions, disease germs, infection, etc.; (4) avoidance of needless exchange of or mutual use of eating utensils, articles of toilet, etc.; (5) danger of infection from flies; (6) pollutions of drinking water and milk supplies.

Philadelphia

Personal.—Dr. Milton B. Hartzell, professor of dermatology at the University of Pennsylvania, was appointed assistant diagnostician and consultant in the Bureau of Health, August 14, to succeed Dr. Jay F. Schamberg, resigned.——Dr. J. William White sailed for Europe, August 16. He expects to be gone eight months, making a tour of the world and returning by the Panama Canal.——Dr. Charles B. Penrose sailed for Europe, August 14.

Spread of Typhoid Fever.—There were seventy-nine cases of typhoid fever reported to the Bureau of Health during the week ending August 16, an increase of fourteen over the previous week. The first week of August, thirty cases were recorded and there has been a steady increase. Nearly all the cases are in the territory subject to intermittent contamination of the water supply, where corporations and manufacturer have made connections as fire safeguards. The administration is doing everything possible to compel discontinuance of such a dual piping system. The Department of Health has issued a warning to householders, supplied by the Torresdale filter plant to boil all water used for drinking.

City Dentists Work for School Children.—The work of the city dentists at the City Hall Dispensary and at the branch in the Southwark School at Ninth and Mifflin Streets, has been of such high quality and of such volume that more branches are planned. Dr. Percy B. McCullough, chief of the dental division of child hygiene, with eight assistants, during the five months from January to the last of May of the present year, at the two dispensaries performed a total of 15,323 operations. School children are sent to the dispensary by the school medical inspectors, and these mean 90 per cent. of the whole 175,000 school children in the city. Each child receives a card on which is written the day and hours each is required to report and this is shown to the teacher, and visits to the dispensaries are attested by the dentist.

GENERAL

Bequests and Donations.—The following bequests and donations have recently been announced:

New York Orthopedic Hospital, $6,748, by the will of O. E. Schmidt.

St. John's Guild, New York City, $2,500, the Home of St. Gile the Cripple, Bronx Children's Aid Society and Society for the Prevention of Cruelty to Children, each $2,000, Brooklyn Hospital, Brooklyn Home for Consumptives and Brooklyn Nursery and Children's Hospital, each $1,000 by the will of Evelyn S. Ridgeway.

Philadelphia Home fo [illegible] $5,000 for the endowment of a free bed by the will [illegible] ey.

Four Albany (N. Y.) [illegible] by the will of Anthony N. Brady, New York City.

Presbyterian Hospital, [illegible] $100,000, one-half to be expended in building and [illegible] ntenance, $5,000 to endow a bed, in memory of [illegible]

Society [illegible] ren, $5,000 by the will of M [illegible]

Mercy [illegible] will of Mrs. Nettie Bernard, Henderson.

Rhode Island Hospital, Providence, $200,000 for the erection of the Jane [illegible] g for private patients, St. Joseph's Hospital, [illegible] the will of Jane Frances Brown.

The Ma [illegible] Hospital, Logansport, $100,000 by the will [illegible] Dykeman.

Department of Agriculture Advises that Milk be Pasteurized at Low Temperature.—In order to determine the best way of pasteurizing milk so as to kill the disease germs and yet not give the milk a cooked flavor or lessen its nutritive value, the Department of Agriculture, through its Dairy Division, has been conducting a series of experiments, treating milk at different temperatures and for different lengths of time. According to the report on these experiments in Bulletin 166 of the Bureau of Animal Industry, when milk is pasteurized at 145 F. for thirty minutes the chemical changes are so slight that it is unlikely that the protein (muscle building element) or the phosphates of lime and magnesia are rendered less digestible than they are in raw milk. Moreover, from a bacteriologic standpoint, pasteurizing at low temperatures is found to be more satisfactory than pasteurizing at high temperatures. According to Bulletins 126 and 161, where low temperatures are used the majority of bacteria that survive are lactic acid organisms which play an important part in the normal souring of milk. When milk is efficiently pasteurized at high temperatures, the bacteria which survive are largely of the putrefactive kinds, and milk so treated if kept for any length of time has a tendency to rot instead of sour. From the standpoint of economy, the technologist of the Dairy Division finds that pasteurizing at low temperatures calls for less heat. It is found that it takes about 23.5 per cent. less heat to raise milk to the temperature of 145 F. than to a temperature of 165 F. A similar gain is a saving of the ice needed, because it will require 23.5 per cent. more refrigeration to cool milk to the shipping point when it is pasteurized at the higher temperature. The department, therefore, recommends that "when market milk is pasteurized it should be heated to about 145 F. and held at that temperature for thirty minutes."

CANADA

New Officers.—Dr. Herbert J. Hamilton has been elected president of the Toronto Academy of Medicine; Dr. Harry B. Anderson, vice-president; Dr. Harry J. Smith, secretary; Dr. Wm. A. Young, treasurer.

Cigarette Smoking Increasing in Canada.—Two hundred million more cigarettes were smoked by Canadians in 1912 than in 1911, the total numbered consumed, according to a report of the Inland Revenue Department, being 975,325,501. Indeed, the consumption of tobacco and alcoholic liquors increased all around. The per capita averages are: Spirits, 1.112 gallons, compared with 1,030 in 1911; beer, 7,005 against 6.598; wine, 131 against 114; tobacco, 3.818 pounds, against 3.679 in 1911, which includes the figures for cigarettes.

New Hospital for the Insane in Ontario.—Twenty miles east of Toronto, near the town of Whitby, facing on Lake Ontario, the Ontario government is establishing a new hospital for the insane, to take the place of the institution now located in Toronto. On a site of 640 acres one of the finest institutions of this character in America is to be established. It is to have accommodation for 1,500 patients, and is so constructed that additional units for the accommodation of five hundred may be added at any time. There are to be a hospital farm, recreation grounds, amusement hall and a church. As far as possible prison labor is being used in every department of construction.

Tuberculosis Prevention in Winnipeg.—Winnipeg took up the fight against tuberculosis in 1908. Since that time proper statistics regarding the disease have been kept, notification was inaugurated, an anti-tuberculosis society established, a dispensary, hospital for advanced cases, an anti-spitting bylaw, day and night camp, open-air schools, much educational work. The provincial government now maintains a sanatorium with accommodation for about sixty patients. By a special grant from the city the General Hospital maintains a dispensary. There are city nurses who follow up cases. The Anti-Tuberculosis Society distributes much literature and has lectures delivered to the public. For advanced cases the city has a hospital of fifty beds. At least seventy-five per cent. of all the cases are now being notified. The death rate from tuberculosis has decreased in the five years from 123.4 per 100,000 of the population to 94.4.

Ontario Medical Commission.—While the citizens and medical profession of Toronto were participating in the opening of the new Toronto General Hospital, they heard of something even as much if not more interesting to the province at large. In receiving the buildings on behalf of the people of the province of Ontario, the Prime Minister, Sir James Whitney, took occasion to announce a most important departure on behalf of his government, to the effect that the government had decided to appoint a royal commission on the whole subject of medical education and the practice of medicine in the province. The object of this commission, Sir James stated, would be to acquire information whereon to base legislation for every imaginable application, so that all could be regulated and controlled in the interests of the people. The Prime Minister said that it was intended that medicine would include all plans or means of alleviating or curing human defects, disorders, diseases or wounds; and to this end an investigation will be made of the College of Physicians and Surgeons and its governing body, the Ontario Medical Council, the medical faculties of all universities, osteopathy, Christian science, dental schools, nurses' training schools, opticians and their training. When this commission is appointed and their report made, legislation will be provided of lasting benefit to the province.

LONDON LETTER

(From Our Regular Correspondent)

LONDON, Aug. 2, 1913.

British Pharmaceutical Conference: Pharmacists Demand Recognition

The fiftieth annual meeting of the British Pharmaceutical Conference has been held in London. It was attended by pharmacists from all parts of the country as well as from Australia and the Continent. The president, Mr. J. C. Umney, who is a member of the committee of reference in pharmacy which assists the pharmacopeia of the general medical council (consisting entirely of physicians), said that the British Pharmacopeia for 1914 was almost ready. The committee of reference had done its best in all loyalty to the general medical council, but he was confident that it was the last occasion on which pharmacists would aid in the revision of the British Pharmacopeia on the conditions which now obtain. Contrasting this country with various foreign countries he emphasized the fact that in the latter medicine and pharmacy were almost equally represented officially on the revision of the pharmacopeia. He suggested that the Pharmaceutical Society should consider a bill laying down the conditions under which future pharmacopeias should be revised. Among the most important papers read were those on the "Possible Iodin Standardization of Thyroids for Pharmaceutical Purposes," on the "Standardization of Opium," and "The Myrrh of Commerce."

The Government Inquiry into Nostrums

In previous letters to THE JOURNAL the evidence given at this inquiry has been published. The report is now under consideration. It is thought that one of the chief recommendations will be that the administration of the regulations affecting the sale and advertisement of proprietary articles should be carried out by one body under one department of the state, instead of under several, as at present. It will probably be agreed also to recommend that quack advertisements professing to cure some of the deadliest diseases, such as cancer and consumption, shall be prohibited and that there shall be a more rigorous censorship of the advertisements of patent medicines professing to cure peculiarly feminine complaints. Another subject with which the report may be expected to deal is whether the venders of patent medicines shall be required to accompany each article with a statement of the ingredients. It is thought unlikely that this recommendation will be made. The view which will probably be taken is that to give a statement of the formula to the state authority would meet the case.

Alarming Increase of the Non-Vaccinated

The last vaccination law (of 1907) was a great concession to antivaccinationist sentiment and exempts from penalty parents who make a declaration within four months of the birth of a child that they believe that vaccination would be prejudicial to its health. The results are shown by the following figures: In 1907 the percentage of exemptions (then obtained by an inconvenient and difficult legal process) was 6.3. In 1908 this percentage had risen to 17.3, and in 1912 to 31.6. It is true that an outbreak of small-pox has not occurred for some years, but sporadic cases are always occurring on ships which arrive in this country from all parts of the world. In this way epidemics have been generated in the past, notably a large one in Glasgow. Health officers are now much concerned at the greater prospects of the spread of the disease. All we can trust to is prompt isolation, for antivaccinationist sentiment is too strong to allow more stringent laws as to vaccination. A small-pox epidemic on a scale unknown to this generation might prove efficacious.

SEVENTEENTH INTERNATIONAL MEDICAL CONGRESS

August 6-12, 1913

(From Our London Correspondents)

The Seventeenth International Medical Congress was formally opened at the Albert Hall, August 6, by Prince Arthur of Connaught, who welcomed the delegates and members in the name of the king. The number of members attending was large, nearly 8,000. The scene was a brilliant one, enlivened by the academical costumes and military and naval uniforms of every civilized country. The presidents of the College of Physicians and the College of Surgeons and the Society of Apothecaries were attended by their mace bearers. Sir Edward Grey, Minister for Foreign Affairs, welcomed the foreign delegates on behalf of the government. He referred to the increased interest of the public in science. The risk of lay ignorance was no longer so intractable as in former generations; the opposition to scientific discoveries had given way to expectation. The public was now teachable. He would not say that with regard to all sciences. If, for instance, politics was to be called a science he would speak with considerable hesitation; not every one was teachable in a subject in which every one thought he understood.

Sir Thomas Barlow, the president of the Congress, then delivered his address. He referred to the previous congress of 1881 in London and to the great men then present who have all passed away. The president was Sir James Paget, the great clinical pathologist, and Jenner, Gull, Wilks, Gairdner, the great teachers of clinical medicine, were there. We shall not see their like again, for their careers began before the days of specialization. Hughlings Jackson, the philosophical exponent of the new neurology, was present. Hutchinson, the patient, accurate recorder of disease in many departments, characteristically was the organizer of the clinical and pathologic museum. The pioneers of abdominal surgery, Wells, Keith and Tate, were there. Huxley, the most brilliant expositor of natural science, discoursed on the relations of medicine and biology. Bowman, the founder of modern English ophthalmology, was present, and Lister, then in the zenith of his great career. Among the foreigners were von Langenbeck, Esmarch, Donders, Snellen, Baccelli, Bigelow, Austin Flint, Billings, Brown-Séquard, Charcot, Lancereaux and others. He reviewed the address of Pasteur, "who towered aloft among his contemporaries," and linked it up with the present studies of Flexner. In his reference to our progress in tropical medicine he said: "Here it is fitting that we should offer our homage to our American brethren for their splendid hygiene work in Cuba, in Panama, in the Philippines, and in Porto Rico, and for the efforts which they are organizing for a world-wide crusade against ankylostomiasis. He referred to our increasing knowledge of the protozoal diseases, to the advances in chemical pathology, and to the gradual evolution of the doctrine of thyroid insufficiency and of its therapeutics, a gradual evolution from Ord's definition of myxedema, a model of deduction, and the consequent study of the internal secretions and the therapeutic employment of organic extracts. The dietetic problems next came under review, particularly the milk problem, and diseases such as beriberi and scurvy, which are associated with a dietetic factor. The study of chronic alcoholism, of oral sepsis, and of intestinal stasis, the discovery and application of the Roentgen rays and radium, the rewriting of physiology in the light of medical knowledge were referred to. The triumphs of surgery were enumerated and the varied ways in which medicine now cooperated with economics, social legislation and philanthropy, which we sum up briefly as public health. Sir Thomas Barlow concluded by welcoming the members in the name, not only of the medical men of the British Isles, but of our brethren of the oversea dominions of the empire.

The Address in Medicine

The address in medicine was delivered by Professor Chauffard of Paris to a large and interested audience in that clear and forceful style which distinguishes the French scientist. He took for his subject "Medical Prognosis: Its Methods, Its Evolution, Its Limitations." Commencing with Hippocrates, he praised the penetrating vision of the Father of Medicine in grasping, coordinating, and interpreting the most minute details without any technical means of investigation. The modern era began with Auenbrugger and Corvisart who introduced percussion, and Laennec, the inventor of auscultation. The latter endeavored, in his own words, "to place in regard to diagnosis internal organic lesions on the same line with surgical diseases." The detection of morbid changes in the living subject gave prognosis a more certain basis. To detect the lesion in the living subject, to identify it in the cadaver and to reduce therefrom diagnosis and prognosis became the system of "organicist medicine" which lasted for more than half a century. This noble system contained much truth, but was a narrow doctrine which tended to confuse the lesion with the disease which caused it. Anatomic prognosis soon found its limitations. The succeeding stage was marked by the influence of Claude Bernard's work. With him pathology became deviated physiology, and disease became a disturbance of normal functions. Coming to the present day, what were the limitations of medical prognosis? An essential distinction must here be made between theoretical and clinical prognosis. Theoretically almost everything is known to us. In a given disease we can enumerate most of the complications or contingencies that may modify its course, but all that is book prognosis, far removed — unfortunately — from the living and individual prognosis, applied not to a disease but to a patient. How many unknown quantities are there in medical practice, and how many surprises! How little does it avail to know all the possible complications of typhoid fever if at a patient's bedside we cannot foresee the intestinal hemorrhage or the perforation which perhaps in a few hours may endanger life. Again, for the newly infected syphilitic, for the gouty subject, for the epileptic at his first attack, for countless other sick patients of all kinds, how many uncertainties for the future! When a morbid condition begins we know theoretically the various paths it may follow; but which one will it follow? That is the real prognostic problem, the solution of which too often eludes our grasp. Finally, and dominating the whole question of prognosis, there remains for us to gage the possibilities of the organism that has fallen a prey to sickness. Shall we find in it the resources necessary for overpowering disease? How much can it stand and how much can we expect of it? That is the great problem which commands and includes all the others. Are we always able to solve it? Professor Chauffard fears not.

The Address in Surgery

The address in surgery by Dr. Harvey Cushing was listened to with great attention by a large audience. It was terse and trenchant and the telling points were frequently applauded. Contrary to expectation, he did not expound some of his original work on brain surgery but took a very general subject, "Realignments in Greater Medicine: Their Effect on Surgery and the Influence of Surgery on Them." He made a strong protest against the antivivisectionist agitation which interferes with the beneficent progress of science that has done so much for humanity. Disorders which gave bread and butter to our predecessors were disappearing as small-pox disappeared after Jenner. One injection robbed diphtheria of its terrors and another meningitis. Typhoid fever was now looked on as a civic disgrace. Tuberculosis was everywhere coming under state care. Governments passed insurance acts which made public officials of the profession at one sweep. Dr. Pound of Cure-Lane was being superseded by his young disciple, Dr. Ounce of Prevention-Street. Surgery had been one of the great factors in the present realignments of medicine, for from Lister and Pasteur the great streams of progress had flowed — in the case of the individual into the art of surgery and in the case of the community into prophylactic medicine. Even the physician who for so long held himself aloof from anything savoring of handicraft returned to it with that useful instrument, the hollow needle. Paracentesis, lumbar puncture and the extraction of blood for diagnostic, or the administration of drugs and serums for therapeutic purposes by a minor surgical act are an acknowledged part of his therapeutic resources. By a strange transformation, too, he became the phlebotomist, and the venesections and cuppings, formerly the overworked province of the barber surgeon, were largely practiced by him. Billroth said about thirty years ago, "Die innere Medicin müsse mehr chirurgisch werden," and this seemed to be what was taking place.

Professor Ehrlich's Address in Pathology

At the general session in Albert Hall Friday, August 8, Professor Ehrlich of Frankfort delivered in German the Address in Pathology taking for his theme chemotherapy. After referring to the work of Jenner, Lister, Sir Patrick Manson, Ross, Castellani, Bruce, Leishman and others in the protozoal diseases, he entered into a technical explanation of the principle of chemotherapy, especially with reference to the work done in elaborating salvarsan. He explained that salvarsan had not only a direct parasiticidal action, but that immunity of parasites to such action could be accounted for only by a purely chemical diminution of their affinity, and a complete exhaustive knowledge of the various chemical peculiarities of a parasite, which he called the "therapeutic physiology of the parasitic cell," was essential for its successful chemotherapeutic treatment. Certain chemical peculiarities are found in many different kinds of parasites. In proportion as more of these chemical affinities were discovered, the greater was the possibility of successful chemotherapy. He still kept in view the idea of freeing the body of microorganisms by one or at most two injections of the proposed remedy, and in his animal experiments this principle is still being pursued. He looked forward to the extension of the principle of chemotherapy as a means of bridging the gaps which still exist in our knowledge of the treatment of some diseases. In the diseases involving protozoa and spirilla good results have already been gained. In a series of other diseases, such as small-pox, scarlatina, typhus, and perhaps also yellow fever, but above all, the infectious diseases caused by invisible germs, there is a bright prospect of success. In the common bacterial diseases due to streptococcus, staphylococcus, and the micro-organisms of typhoid, dysentery and tuberculosis he feels that the struggle is a hard one, but that success in these diseases will also be attained on the principle of chemotherapy.

Dinner by the Government to the Congress

Nothing could have been more appropriate than the welcome given to the Congress, when Lord Morley, representing the British government, entertained at dinner on Tuesday night, August 5, at the Hotel Cecil, upward of five hundred of the more eminent members of the Congress, including most, if not all, the official representatives. Lord Morley referred to the generation that had passed since the Congress last met in London (in 1881), and to the marvels in mechanics, engineering, electricity and applied chemistry that had been witnessed in the interval, but added that the new truths and new expedients in medicine and the advance in pathology and surgical practice might be counted the most striking marvel of them all. Referring to specialism, he said it was of two kinds, the narrow and the broad, and he hoped that in medicine it would ever be of the latter kind, in which priceless and indispensable work was done in regard to particular organs, parts, and regions, maladies and lesions, so that touch was not lost with organization and function as a whole. As to the relations between politics and medicine, he said that the relations of the government with the medical profession were for the moment not altogether of the easiest, but he assured his hearers that the difficulties were ephemeral and would be surmounted by and by. (This was in reference to the National Insurance Act.) He referred to the great extension of medical influence in the political and social field and in the family and administration of laws, and pointed to "a whole code of housing acts, shops acts, and health acts, including the pending Mental Deficiency Bill, and to the medical protest against the speeding up of education." He touched on the vivisection question, saying that there was a great volume of energetic opinion against unrestricted experiments on living animals, and on the venereal diseases question, saying it would be sheer moral cowardice to shrink from a large and serious inquiry into the extent, causes, and palliatives of this hideous scqurge, just as we investigate tubercle or cancer.

Sir Thomas Barlow, President of the Congress, in replying commended the selection of Lord Morley as the government spokesman, for to him we were indebted for instruction in the aims, the partial successes, and the failures of many of the leaders of liberal thought before and at the time of the French Revolution, as well as for the lessons in political philosophy drawn by him from the lives of our eminent statesmen. M. Landouzy, replying for the French-speaking members, drew a parallel between the great geniuses of England and France who had contributed to the march toward progress through the ages, and referred to depth as the distinguishing characteristic of the British temperament. Professor von Schjerning replied for Germany, and proposed the toast of the British Government.

Other Entertainments

The entertainments and excursions afforded were so numerous and lavish that it would be out of the question to attempt to describe them all. In the evening of August 6 the president of the Congress, Sir Thomas Barlow, with the officers, entertained the members of the Congress with their wives and daughters at a conversazione at the Natural History Museum, South Kensington. The museum was thrown open for inspection.

An interesting exhibit was that of Mr. J. Hartley Durrant and Lieut.-Col. W. O. Beveridge, which illustrated the investigation made under the joint auspices of the war office and the British Museum into the nature and origin of the damage occasioned by insect pests in the army biscuits.

On Thursday the Continental Anglo-American Medical Society held its annual luncheon at the Café Royal, and an invitation luncheon took place at the Royal School of Medicine for Women. St. George's and the Middlesex Hospitals were thrown open to parties of visitors, afternoon tea being provided. From 3:30 to 6 Sir Alfred Pearce Gould (the dean) and the Faculty of Medicine of the University of London gave a garden party at Regent's Park College, while the president, treasurers and governors of the Royal hospitals of Bridewell and Bethlehem held a reception in the grounds of Bethlem Hospital. In the evening a dinner was given by the Society of Apothecaries to a limited number of guests in their quaint old hall in Drury Lane. The society has a most interesting history. It was to its efforts that the first medical act, in 1815, which made the possession of a medical qualification an essential for the lawful practice of medicine, is due. The society worthily maintains the traditions and repute of the city companies as lavish yet perfect hosts, and no medical dinners are more widely renowned than those given on occasion by it. The master and wardens received the guests, which included such eminent names as those of Sir Thomas Barlow, Sir Alfred Pearce Gould, Dr. Josué, Professor Janet, Dr. Lovett, Sir Lauder Brunton, Sir Watson Cheyne, Professor Biedl, Sir Malcolm Morris, Sir David Ferrier, Sir Clifford Allbutt, Prof. Sims Woodhead, Professor Abderhalden, Professor Wenkebach, Professor Bateson, Prof. A. R. Cushny, Prof. W. Straub, Sir Arbuthnot Lane, Dr. W. J. Mayo, Professor Ehrlich, Professor Burkhardt and many others. The toast of "Our Foreign Guests" was responded to by Dr. Josué, Prof. Dr. Burckhardt and Dr. Lovett. The quaint old ceremony of drinking from the loving cup was duly performed with its historic ritual. The dinner broke up early, to allow many of the guests to attend one or other of the soirees at the Royal College of Surgeons, at which some 2,000 were present; the Royal Society of Medicine, which entertained another 1,000; the Royal Army Medical College, Milbank, where some 800 were present, and the Grocers' Company, which entertained 500 more. Besides the foregoing, which were general entertainments, there was a reception by the Medical Director General of the Royal Navy at Greenwich to the members of Naval and Military Medicine and of Tropical Medicine and Hygiene at Greenwich in the afternoon, and in the evening a soiree given by Mr. Arthur Cheattle, president of the Otological Section, receptions by the Laryngological and the Anatomical Sections, and the dinner of the Ophthalmological Section.

Friday the 8th was no less full of entertainment than the preceding day, consisting of luncheons, hospital visits and visits to many points of interest.

Sir Thomas Barlow presided at a breakfast given by the National Temperance League, and was supported by Sir Alfred Pearce Gould and Sir Victor Horsley. He referred to the change that had come over the profession in regard to the indiscriminate prescribing of alcohol, and he uttered a special warning to the profession against a "most mischievous thing" in the prevalence of medicated wines. Alcohol ordered therapeutically at all should be given by itself under the strictest conditions as to time of administration, dosage and the continuance of its use. If they believed men were better without alcohol in any form he urged them to use their influence against it.

The Archbishop of Canterbury and Mrs. Randall Davidson entertained some 350 to tea at Lambeth Palace. In the evening at 8 o'clock the Lord Mayor and corporation of the City of London gave a conversazione at the historic Guild Hall. The assembly was of extraordinary brilliancy, court dress, military and naval uniforms and academic gowns and hoods producing a truly kaleidoscopic picture.

The section entertainments were equally numerous.

Of these dinners special note should be taken of that given by the Tropical Medicine Section and the Society of Tropical Medicine and Hygiene under the presidency of Sir David Bruce. Sir David, in toasting the "Progress of Tropical Medicine" reviewed its history from the discovery in 1879 by Sir Patrick Manson of the rôle played by mosquitoes in filarial disease. He referred to Laveran's discovery of the malarial parasite between 1878 and 1880, and quoted a remark of King George that when he was a young lieutenant in the navy no sailor could go into the hospital at Malta without being struck down with Malta fever, and now, the King added, "thanks to the doctors, Malta fever is extinct." The work of Smith and Kilbourne on Texas fever in 1889, Sir Ronald Ross' work on malaria in 1898, and "the wonderful work of Reed, Carroll, Lazear and Agramonte on yellow fever" in 1900 were extolled. Finally in 1903 Colonel Sir William Leishman had uncovered the nature of the mysterious disease, kala azar.

The toast was responded to by Dr. A. Laveran, Dr. B. Hecht and Sir Patrick Manson. Sir Ronald Ross gave the toast of the visitors and guests, which was acknowledged by Professor Agramonte, Professor Blanchard, Professor Eijkman, Professor Fullerton and Dr. Wu of International Plague Commission fame.

International Medical Press Association

The International Association of the Medical Press held its first meeting in Jehangir Hall, University of London, August 5, Dr. Lucas Championnière presiding. An interesting paper was read by M. Blondel of Paris, Secretary of the Association, in which he urged a unification of medical nomenclature by an international commission, the use in all medical journals of the official terms thus to be codified, or of domestic derivatives therefrom, so that the necessary vocabulary for foreign readers of any journal might be reduced to the more common verbs, prepositions and adverbs of the language, the technical terms being practically international. He further suggested that where writers failed to observe this plan, the international terms should be inserted in parentheses after the national term used by the writer, at any rate in the title and the conclusions. Such a course, if adopted, would undoubtedly facilitate the reading of articles in foreign medical literature by those possessing even the most rudimentary knowledge of the language of publication.

Professor Posner of Berlin presented a report, which was subsequently accepted, in which he urged the formation of technical committees to supervise advertisements in the medical press, with a view to excluding such as contained false claims, and generally purifying and elevating the standard of the advertising columns.

Dr. Dejace (Belgium) was elected President on the retirement of Dr. Lucas Championnière, and Dr. Raoul Blondel (Paris) and Dr. Dawson Williams (London) were reelected respectively general secretary and treasurer. The next meeting will take place at the time and place of the next International Medical Congress.

International Association of Medical Museums

At the Royal College of Surgeons Museum, Lincoln's Inn Fields, Professor A. S. Warthin, of the University of Michigan, presided over a conference of the International Association of Medical Museums on Tuesday, June 5. Professor Warthin said there were now nearly two hundred members, by far the larger number being in America, but the foreign membership was constantly growing. The line of development had broadened. It was no longer a purely pathological museum that was contemplated, but one extending much further into all fields of medicine, particularly preventive medicine. He strongly urged the development of state or municipal traveling museums of preventive medicine and hygiene on a popular basis, such as the traveling tuberculosis museums which had given such excellent results in the United States. The success attained in the United States of America had led to the development of the traveling museums so as to include besides tuberculosis the prevention of typhoid and other transmissible diseases. Sir William Osler pointed out the geographical difficulty in the international development of the association and suggested the formation of a central bureau to control the different branches in various countries, but each country must have autonomy in managing its own museums. He recommended triennial meetings to be held wherever the International Medical Congress meets.

Women and the Congress

No public function of note would be complete in these days without the hallowing presence of the "suffragette," so it is comforting to note that suffragette sandwich-women paraded around the Albert Hall with placards asking "What do doctors think of woman torture? The government is murdering women." Some of them even buttonholed the doctors and essayed to lay their grievances before them, but apparently they tackled foreigners for the most part, who obviously failed to comprehend what they said. Later the following inscription was chalked on the sidewalk in front of the principal entrances to the various halls: "MM. les Médecins, que pensez-vous de la torture imposée sur les femmes par le gouvernement anglais?" and a similar question in German.

The progress of woman's emancipation was, however, marked in a practical fashion in the present congress. In 1881 the *Lancet* reminded the forty-three duly qualified medical women who protested against the exclusion of medical women from membership, that "the Congress is a voluntary assemblage of medical men for a certain purpose, and those who are not asked to join suffer no infringement of their rights." But women doctors abounded at the present congress, and several of them took a distinguished part in the proceedings.

Degrees for American Surgeons

An event of special interest to American medicine took place on the opening day when the Royal College of Surgeons conferred the honorary fellowship of the college on fifteen eminent foreigners, among them Dr. G. W. Crile, Dr. Harvey Cushing, Dr. W. J. Mayo and Dr. J. B. Murphy. The newly elected fellows were entertained at dinner in the college.

The Section Proceedings

A comparison of this congress with the previous London Congress of 1881 shows great differences. In the latter there were only a little over 3,000 members — less than half of the number present on the opening day and the work was divided into fifteen sections. In this congress there were twenty-three sections. While many of the famous medical men of the world were present, it cannot be said that the congress revealed any important discovery, its work consisted largely of stock taking of recent medical progress, showing what new views were becoming accepted. Many of the papers were of great interest and importance, but there were also many which were not and were but a repetition of what was well known, or were crude and unconvincing. The program was generally overcrowded and speakers often raced the clock to get in what they wanted to say in the allotted time, and were brought to a premature end by the chairman's bell. As in all medical [illegible] capacity of even those who were eminent and [illegible] say, to say it properly and concisely, was [illegible] The fifteen minutes allotted to a speaker if properly used was in most cases amply sufficient to present his conclusions and his reasons for them, but want of conciseness of expression as well as want of judgment in suppressing unnecessary details prevented this. Instead of brief but sufficient general description worse than useless details which only wearied the audience were presented. It is curious that no one seems to trouble about the reform of this universal evil. The man who could compel the education of medical authors in the art of conciseness, before they be permitted to speak or write, would deserve a place in history among the benefactors of humanity.

Section on Medicine

The proceeds of the section on medicine were opened Thursday, August 7, by the president, Prof. Sir William Osler, Bart., with a few introductory observations. Over two hundred members of the section were present, and the first paper heard was Professor Banti's (Florence) exhaustive account of the clinical aspects of hemolysis, more particularly as they affected the spleen. In many patients with splenomegaly, as he pointed out recent work tends to prove that the anemia in such patients is due to excessive hemolysis in the pathologically enlarged spleen. He referred to the association of splenomegaly with cirrhosis, a combination that is familiar, by name if not *de visu*, to most medical men as Banti's disease. He summarized the work that has been done so extensively on the continent of Europe with hemolytic serums, and noted that the spleens of animals treated with such serums showed changes very similar to those met with in the splenomegaly with anemia of human beings.

Professor Chauffard of Paris ascribed an important rôle to the spleen in all the human diseases that were characterized by the occurrence of hemolysis. He did good service by bringing out the fact that the enlargement of the spleen habitual in these cases might be either the cause of the hemolysis, or its effect. If it was the cause of the hemolysis, clearly the condition would be improved and the anemia cured by the operation of removing the spleen. If, on the other hand, it were an effect of the hemolysis, splenectomy would only accelerate the patient's passage to the grave. How can one distinguish between the two cases, he asked, and how can one know when splenectomy is advisable? These questions he could not answer with any confidence himself, and he called for further investigation and information on the results of removal of the spleen: animal experiments had given contradictory results in the hands of different observers.

An interesting paper on "Duodenal and Pyloric Ulcers" was read by Prof. C. A. Ewald of Berlin. Professor Ewald pronounced himself horrified by the statistics of British and American surgeons, who claim to have proved that duodenal ulcer is a commoner, perhaps a far commoner, complaint than ulcer of the stomach. How could such statements be justified? he asked. Reference to the post-mortem room statistics afforded no support to such surgical statements; in his own clinic he had treated 532 cases of gastric ulcer and eighty-two of duodenal ulcer during the three years, 1910, 1911, 1912, and he quoted continental (European) statistics to prove that as a matter of fact gastric ulcer is quite six times as common as ulcer of the duodenum. Yet he was at pains to acquit the surgeons of intentional error in their statistics, and explained that their mistake arose from the fact that they only meet with the severe and the chronic cases of such ulceration, on the one hand, and on the other from their habit of including among duodenal ulcers those ulcers that extend from the pylorus. Professor Ewald doubted whether regional or occupational factors could afford an explanation of the surgical statistics and the inferences surgeons drew from them. He further felt himself bound to dissent very strongly from the dictum of Sir Berkeley Moynihan, who said that a careful history sufficed to make the diagnosis of duodenal ulcer, and that it was not necessary to examine the patient before coming to a positive conclusion. Professor Ewald pointed out how patients with cholecystitis, appendicitis, tabes with gastric crises, or even severe neurasthenia, might find themselves exposed to operations for the cure of non-existent duodenal ulcers, should such diagnostic criteria as Moynihan's be accepted as adequate. He himself laid stress on three or four points in particular, in the diagnosis of duodenal ulcer: (1) The long duration of the case, and the recurrence of pain two or more hours after food had been taken; (2) the pressure of blood, manifest or occult, in the stools; repeated examinations might be called for; (3) hyperchlorhydria, which is almost constantly found, even when the stomach is free from food; (4) skiagraphic examination of the stomach after a bismuth meal; the duodenum fills up with unusual rapidity, the stomach is often not empty after six hours, the gastric peristalsis is abnormally forcible, and the stomach itself is frequently displaced downward and to the right. Dr. Max Einhorn and Prof. N. E. Brill of New York both disclaimed the surgical statistics to which Professor Ewald had taken such exception, so far as America was concerned, while Prof. R. Saundby (Birmingham), though advocating operative treatment in a large number of the cases of duodenal ulcer, expressed himself as not prepared to go as far in this direction as certain eminent British surgeons.

In the afternoon Prof. N. E. Brill of New York read an interesting paper on "An Acute Infectious Disease Similar to and Perhaps a Modified Form of Typhus Fever." He laid stress on the complete absence of contagiousness characterizing the complaint; typhus fever, on the other hand, was notoriously catching. The new complaint, again, was practically never fatal—out of some 400 cases he had collected only one had died. Typhus fever, on the other hand, was fatal to from 18 to 25 per cent. of the patients as a rule; in even the mildest of the typhus epidemics hitherto described the mortality had been as high as from 5 to 8 per cent. No general discussion of the paper took place, owing to the lateness of the hour. But the upshot of the whole matter was that Professor Brill's disease may in all probability be set down as an unusually mild and benign form of typhus fever.

(To be continued)

PARIS LETTER

(From Our Regular Correspondent)

PARIS, Aug. 1, 1913.

Fraud in Connection with Industrial Accidents

I have spoken of the disgraceful behavior of certain "clinics" for industrial accidents, which have tried in all sorts of ways to get hold of injured working men. The Committee of the Chamber of Deputies on Insurance and Social Welfare has taken up the matter. It decided to introduce the following clause into the bill relating to occupational diseases which is now under discussion: "Any one who by threats, gifts, promises of money, rebate on medical fees or charges for druggist's supplies, made in industrial accidents to syndicates or companies or heads of business enterprises or insurance companies, or any other person, has enticed or attempted to entice the victims of industrial accidents or occupational diseases into any clinic or doctor's office or drugstore and thus has limited or attempted to limit the freedom of the workman in choosing his physician or druggist, shall be subject to a fine of from 100 to 500 francs (about $20 to $100) and to an imprisonment of three days to three months."

Nurses in Religious Orders and Hospital Services

About a year and a half ago (THE JOURNAL, Jan. 27, 1912, p. 289) I mentioned the commotion caused in the medical profession by the decision of the government requiring the substitution of lay nurses for the sisters of the Order of St. Martha in the sanatorium at Périgueux. The Union des Syndicats médicaux de France joined with the physicians of Dordogne in protesting to the government against interference with the free choice of the staff in private clinics and urged the medical representatives in parliament to present a bill on the subject. The Association générale des médecins de France also committed itself to the same point of view. In the hospitals belonging to the city and general government, moreover, there has been an increasing sentiment lately against laicization. The mayor of Marseilles recently received a delegation which presented a petition signed by more than 130,000 persons, demanding the restoration of the members of religious orders in the municipal hospitals there. A municipal councilor of Paris, M. de Puymaigre, has proposed the admission of members of religious orders to the hospitals of the city of Paris and the department of the Seine on the grounds of the difficulty of obtaining lay nurses for the slender salaries offered. Even if the lay staff is retained, the hospitals ought not to be deprived of the service of the religious orders, which is the more desirable because the sisters are content with a very modest salary. Some hospitals might be served by members of religious orders and others by lay nurses, so that the patient might have his choice of nurses. The Syndicat médical de Paris and the Syndicat des médecins de la Seine have approved the proposal. At Grenoble a petition for the restoration of the sisters, bearing 25,000 signatures, has been rejected by the board of administration of the hospitals of that city, which declares itself quite satisfied with the lay nurses, to whose good qualities the board bears testimony.

The Sale of Drugs by Midwives

A midwife at Saulnes was arrested for abortion. Her house was searched and various drugs were found in it. She was acquitted of illegal practice of pharmacy on the ground that the law permits physicians or officers of health to keep drugs in localities where there is no drugstore. Thus the court admitted that midwives were officers of health. The court of appeals at Nancy has reversed the judgment and fined the midwife $100 (500 francs) on the ground that midwives, being licensed to practice only their own specialty, are not officers of health and therefore can handle only drugs necessary for his specialty.

Death of Professor Coyne

The death of Dr. Paul Coyne, former professor in the Faculté de médecine de Bordeaux and national correspondent of the Académie de médecine, is reported.

BERLIN LETTER

(From Our Regular Correspondent)

BERLIN, July 25, 1913.

Municipal Purchase of Mesothorium

On favorable reports as to the therapeutic effects of mesothorium in cancer, the communal authorities of Essen have determined to purchase 200 mg. of the preparation. Half of the necessary sum, $10,000 (40,000 marks), has been raised by private subscription and the rest has been appropriated by the communal authorities.

Colonial Prizes

The well-known wholesale merchant, Woermann of Hamburg, whose father had a great share in the founding of the first German-African colony, has offered the faculty of the Colonial Institute at Hamburg $1,500 (6,000 marks) as a prize for the best discussion of the question, "By what practical means can an increase of the birth-rate and a reduction of the infant mortality among the native colored population—the most important economic factor of the colonies—be secured?" In addition to the medical aspects of the question, the work must include consideration of the religious, ethnographic and economic relations which may influence the birth-rate and infant mortality among the natives of the colonies, and in addition must include practical suggestions for increasing the birth-rate and reducing the infant mortality among the native colored population. The investigation need not be extended to all of the protected districts. Articles which are confined to one district may be admitted for competition. The articles must be written in the German language, and reach the faculty of the Colonial Institute at Hamburg, Dec. 31, 1914, at the latest.

International Health Office in Jerusalem

An international health bureau has been founded at Jerusalem by the German Society for combating malaria in Jerusalem *(Deutsche Gesellschaft zur Bekämpfung der Malaria in Jerusalem)*, the Jewish health office (Nathan Straus foundation), and an association of Jewish physicians and sanitarians *(Gesellschaft jüdischer Aerzte und Naturwissenschaftler für sanitäre Interessen)*. Departments are provided for malaria, for hygiene, a serologic and Pasteur antirabic institute, and a bacteriologic and tuberculous department. Professor Mühlens is director of the health office.

International Conference on Tuberculosis

The International Conference on Tuberculosis will occur in Berlin, October 22-25, with Bourgeois of Paris as president. With it there will be two weeks of educational trips for information in hygiene of which one will be to Munich, Nurnberg, Heidelberg, Baden-Baden, Frankfort and Giessen, and the other to Düsseldorf, München-Gladbach, Leverkusen, Essen, Hamburg and Berlin. Those intending to be present should send announcements to the general secretary, Professor Pannwirt, 12 Schönebergerufer, Berlin.

VIENNA LETTER

(From Our Regular Correspondent)

VIENNA, Aug. 5, 1913.

Professor His Refuses to Come to Vienna

Professor His, who was asked to accept the appointment of director of the medical clinic as successor of von Noorden, has decided to decline the honor. The reasons given by him—disinclination of the family—are surely not the only ones, and there must be something else which causes so many eminent scientists—Strümpell, von Noorden, Abderhalden, His—to refuse to come here, since a call to Vienna was once regarded as the highest honor. The trend of opinion now among the faculty is that an inland man ought to be called; but since some of the most eminent candidates are Jews or come from Jewish stock the religious prejudices here will not permit their being appointed. Therefore the number of inland men fit to accept such a call is very small indeed, from racial and religious points of view.

Small-Pox Mortality in Austria Since 1886

Statistical data dealing with the mortality from small-pox are available for Austria since about 1886, when practically compulsory vaccination was introduced with the effect that within a few years the overwhelming majority of the population (about 85 per cent.) were vaccinated; and now more than 98 per cent. of the population have been vaccinated at least once during their life. The results are clearly visible in the returns of the mortality tables of the Registrar General. In the year 1886 10,163 persons died in Austria from small-pox, or 434 per million inhabitants. The average mortality from this source in the five years (1891-1895) following the first lustrum was 4,484 per year, or 180 per million, meaning a drop to less than a half of the original figures. The next five years averaged only 1,427 deaths per year, or 60 per million (one third of the figure stated for the preceding period). A still more rapid fall is noted in the next five years (1901-1905), averaging 36 deaths, or 13 per million. The figures for 1906 were 39 deaths; for 1907, 41; for 1908, 14 deaths; for 1909, 13, and for 1910, 5, averaging for these five years 22 deaths annually, or 0.8 per million of inhabitants. If we compare these figures with the data obtained for instance from Great Britain, we find the most instructive fact that there occurred three epidemics of small-pox in the United Kingdom within this period (1887-1888, 1893-1894 and 1902-1904). The last-mentioned epidemic alone claimed 4,731 victims, and the explanation is to be found in the fact that numerous persons availed themselves of the opportunity offered them by the law by declaring their "conscientious objection" against vaccination and thus being exempt from compulsion to submit to it. In Austria, on the other hand, most of the younger generation of doctors have not seen a real small-pox case except in pictures of a dermatologic atlas. Only in seaports where now and then an imported case is brought into the quarantine hospital do we occasionally receive instruction of this kind. The cases observed inland within the last few years were all traced to Turkey and Italy, whence travelers had come hither already infected.

The War and the Cholera in the Balkans

The new Balkan War has again caused an outbreak of cholera in the war district, and the wounded soldiers being sent home or into the rear hospitals have spread the disease all over the fighting countries. Especially in Servia and Bulgaria there are numerous cases, although they are officially not known. One of the most fruitful sources of infection seems to be the abundance of flies; at least all soldiers and war correspondents are convinced of it, even if the scientific proof has not yet been obtained. Myriads of flies feed on the heaps of corpses of the slain of those who have died from cholera and remained unburied for days, and they multiply and infest everything in the fearful heat raging in the Balkans just now. Reports from the new Red Cross missions always point out the calamity encountered by the multitude of flies. Stringent precautions have been taken on the Austrian frontier to guard against the entrance of cholera. The wet, cool weather prevailing in central Europe has assisted the officers of the boards of health in the endeavor to keep the disease out hitherto.

The Danger of Whooping-Cough and Other Infectious Diseases

Statistics regarding the fatal cases of whooping-cough, compared with the mortality of scarlatina, measles and diphtheria, show the startling fact that the first-named disease twenty years ago was more dangerous than even scarlet fever, and that now it still is worse than diphtheria. The following figures are taken from the official report of the Austrian Board of Health and published by Dr. Langer in the *Oesterreichische Sanitätswesen* for 1913, No. 21.

REPORTED FATAL CASES IN AUSTRIA

Year	Whooping-Cough	Scarlatina	Measles	Diphtheria
1890	27,274	12,158	15,182	28,514
1908	8,714	14,366	7,929	7,924

In these figures the numerous deaths due to complications of whooping-cough are not considered. Special attention should therefore be paid to this dangerous disease, as not so much change of air as pure air alone is necessary for the cure of the attacks.

Marriages

WARD BOLEYN MACCAFFRY, M.D., U. S. P. H. S., Fort Monroe, Va., to Miss Laura Garside Stott of Philadelphia, in New York City, July 9.

JOHN W. ELDER, M.D., Des Moines, Ia., to Miss Ethel Eleanor Chamberlin of Adel, Ia., at Des Moines, August 8.

CHARLES JOHN BOEHS, M.D., M.R.C., U. S. A., to Miss Hattie Collier of Houston, Tex., at San Francisco, July 31.

THOMAS JOHN EMBERTON HOLMES, M.D., Paterson, N. J., to Miss Martha M. La Paugh of Port Jarvis, N. Y., June 9.

HERBERT EDWIN WILKINSON, M.D., to Miss Pheby St. Thomas, both of Eagle Lake, Minn., August 4.

CLAUDE GRANVILLE CRANE, M.D., to Miss Elizabeth K. Thistle, both of Brooklyn, N. Y., August 7.

LOUIS JOHN KAUFFMANN, M.D., Millville, N. J., to Miss Maria G. Keenan of Philadelphia, August 6.

ALVAH LEWIS SAWYER, M.D., Chicago, to Miss Marion L. Messer of Beloit, Wis., June 21.

EDWARD J. DEIBERT, M.D., to Miss Flora E. Bader, both of Hillerton, Pa., August 5.

ALLAN MCNALLY, M.D., to Miss Ida L. Sanaman, both of Louisville, August 2.

Deaths

Alfred Watt, M.D. University of Toronto, Ont., 1890; superintendent of the Government Quarantine Station at William Head, B. C.; is said to have committed suicide July 27 by leaping from the third story window of a hospital in Seattle.

Ezekiel Y. Salmon, M.D. University of Nashville, Tenn., 1857; surgeon in the Confederate Service during the Civil War and later a practitioner of Nashville and Lynchburg, Tenn.; died at his home in the latter city, July 8, aged 83.

Giovanni C. D. Caruso, M.D. Royal University of Naples, 1888; a fellow of the American Medical Association; who had devoted much attention to hygiene; died at his home in Cleveland, June 27, from cerebral hemorrhage, aged 52.

John Baker Swift, M.D. Harvard Medical School, 1877; a member of the Massachusetts Medical Society; for one year port physician of Boston; gynecologist to Carney Hospital; died at his home in Boston, July 29, aged 59.

Ruth A. French, M.D. Woman's Medical College of Pennsylvania, Philadelphia, 1867; at one time professor of anatomy in her alma mater; formerly of Petaluma, Cal.; died at her home in Santiago, June 23, aged 74.

Emma E. Richards, M.D. Woman's Medical College of Pennsylvania, Philadelphia, 1886; for three years school director, of Norristown, Pa.; died in her home at Wyomissing, Pa., July 31, from neurasthenia, aged 63.

Anson Cordian Smith (license, Minn., 1887); of Cleveland and Eagle Lake, Minn.; a practitioner for more than half a century; a veteran of the Civil War; died at the home of his son in Eagle Lake, July 20, aged 79.

Robert Henry Bigger, M.D. University of Victoria College, Coburg, Ont., 1866; for twenty-seven years a practitioner of Indianapolis, and later of Carrollton and Mount Vernon, Ill.; died in Los Angeles, July 27.

David Shoemaker, M.D. Cooper Medical College, San Francisco, 1891; a member of the Medical Society of the State of California; died suddenly at his home in Auburn, Cal., July 19, from heart disease, aged 48.

J. Benjamin Jones (license, South Carolina, years of practice); a practitioner since 1879; for many years a practitioner of Laurens, S. C.; died at the home of his nephew in Greenville, S. C., July 19, aged 57.

William Edward Alumbaugh, M. D. Hahnemann Medical College of the Pacific, San Francisco, 1889; formerly of Watsonville, Cal.; died at his home in Napa, Cal., July 6, from arteriosclerosis, aged 76.

George Victor Winter, M.D. Northwestern University Medical School, Chicago, 1911; of Albany, Minn.; died in a hospital in St. Paul, July 29, a week after an operation for appendicitis, aged 33.

Harvey Allen Snyder, M.D. Cleveland Homeopathic Medical College, 1904; at one time a member of the Barberton (O.) school board; died at his home in that city, July 31, from pneumonia, aged 44.

Bernard Aloysius Duhigg, M.D. Long Island College Hospital, Brooklyn, 1894; formerly of Bath Beach, Brooklyn, N. Y.; died at the residence of his brother at St. James, L. I., July 29, aged 41.

Edward Francis Dowd, M.D. Harvard Medical School, 1898; famous while in college as a baseball pitcher; died at his home in Waltham, Mass., from pneumonia, July 26, aged 38.

David Howland Cannon, M.D. Harvard Medical School, 1873; for many years chairman of the Mattapoisett (Mass.) Board of Health; died at his home in that place, July 2, aged 69.

James J. Burch, M.D. Medical College of Georgia, Augusta, 1893; of Double Branches, Ga.; died suddenly in Elberton, Ga., July 22, from cerebral hemorrhage, aged 50.

George Porterfield Morrison, M.D. New York University, New York City, 1881; died at his home in Martinsburg, W. Va., July 24, from cerebral hemorrhage aged 59.

Walter A. Reynard, M.D. Georgetown University, Washington, D. C., 1907; died at his home in Stamford, Conn., July 30, from ptomain poisoning, aged 27.

Ira L. Jones, M.D. University of Buffalo, N. Y., 1864; one of the oldest practitioners of Oswego County, N. Y.; died at his home in Minetto, July 30, aged 81.

Henry V. Worley, M.D. Rush Medical College, 1880; an early settler of Pierce City, Mo.; died at the home of his daughter in that city, July 31, aged 62.

Hutcheson James Nash, M.D. University of Toronto, Ont., 1861; medical officer of health for Forest, Ont.; died at his home in that place, May 17, aged 67.

Samuel S. Boyer, M.D. Jefferson Medical College, 1864; a surgeon of volunteers during the Civil War; died at his home in Washington, D. C., aged 76.

Fred M. Klussman, M.D. Kentucky School of Medicine, Louisville, 1897; died in his apartment in Spokane, Wash., July 21, from heart disease, aged 38.

Neil McIntyre, M.D. University of Toronto, Ont., 1886; of Phoenix, Ariz.; died at his summer home in LaJolla, Cal., July 26, aged 71.

Eliza M. Miller, M.D. Hahnemann Medical College, Chicago, 1886; died at her home in Los Angeles, July 6, from paralysis, aged 75.

Hamilton W. Dimmitt, M.D. Medical College of Ohio, Cincinnati, 1888; died at his home in Germantown, Ky., July 17, aged 46.

Thomas Henry Stark, M.D. Trinity Medical College, Toronto, 1881; died at his home in Toronto, June 9, from angina pectoris.

Adolph Moeller, M.D. Rush Medical College, 1888; formerly of Milwaukee; died in Alhambra, Cal., July 27, aged 53.

Jerrold D. Ball, M.D. University of Toronto, Ont., 1874; died recently at his home in Toronto

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

SOME MISCELLANEOUS NOSTRUMS

Himalya; the Kola Compound

Though advertised as "Nature's Great Specific for the Cure of Asthma," the chemists of the North Dakota Agricultural Experiment Station reported "Himalya, the Kola Compound" to be "a weak hydro-alcoholic solution of potassium iodid, flavored with peppermint and licorice and colored with caramel." While the name would indicate that the active ingredient of the stuff was kola, the chemists stated that "little, if any, kola enters into the preparation." The preparation contains more than 9 per cent. alcohol, yet the exploiters recommend it to be taken with whisky! The stuff was sold for $2 a bottle; "it could be prepared," according to the North Dakota chemists, "by the average pharmacist for, say, about a dime."

Mrs. Bradley's Face Bleach

The claims made for this stuff, which emanates from Minneapolis, are that it "removes moth, tan, freckles, pimples, blackheads, prevents wrinkles, oiliness and aging of the skin." What else it does is left to the seeker after beauty to learn by experience. Its ingredients were reported by the North Dakota Government Agricultural Experiment Station to be Epsom salts (magnesium sulphate) and corrosive sublimate (mercuric chlorid). A more detailed analysis appeared in the *Druggists' Circular*, March, 1913:

Anhydrous magnesium sulphate	45.7 per cent.
Sodium chlorid (common salt)	9.7 per cent.
Mercuric chlorid (corrosive sublimate)	23.6 per cent.
Water	23 per cent.

Dr. T. Felix Gouraud's Oriental Cream or Magical Beautifier

As long ago as 1907, Dr. T. Felix Gouraud's Oriental Cream or Magical Beautifier was analyzed by the state chemists of New Hampshire, who reported that it consisted of "approximately one-half ounce of calomel suspended in a short half-pint of water." More recently—in 1912—it has been analyzed by the chemists of the Connecticut Agricultural Experiment Station, whose report is practically identical with that of the New Hampshire chemists. Some of the claims made for this simple mixture are:

> "Purifies as well as beautifies the skin. No other cosmetic will do it."
>
> "Removes tan, pimples, freckles, moth patches, rash and skin diseases and every blemish on beauty and defies detection."

An eight-ounce bottle of this preparation costs 98 cents. As the Connecticut chemists say: "The amount of calomel in a bottle of this substance can be bought at retail for about 6 cents; the remaining 92 cents is the charge for a half-*pint of water*."

Cat-Er-No "Soules"

On this article, which is said to be made by the Soule Medical Company, Minneapolis, the chemists of the North Dakota Experiment Station reported: "Sample was an aqueous solution of menthol with just enough of a vegetable drug present to give it a color. There was less than 0.1 of 1 per cent. of total solids. Sample would be of little value as a catarrh cure."

Ely's Liquid Cream Balm

This preparation, which is sold as a "remedy for catarrh, catarrhal deafness, hay fever, cold in the head," is a pinkish liquid having the odor of thymol and menthol. It was analyzed by the chemists of the Connecticut Agricultural Experiment Station, who reported that it "appears to consist essentially of liquid petrolatum with small quantities of thymol and menthol." The chemists further asserted that a bottle of

Ely's Liquid Cream Balm costing 69 cents contains about half a-cent's worth of liquid petrolatum.

Dr. Boskano's Cough and Lung Syrup

Still another "new remedy for the positive cure of consumption, coughs, colds, etc." As long ago as 1908 the Kansas State Board of Health showed this remedy to be misbranded, describing it as "a saccharin solution of expectorant drugs with tar and chloroform." In 1911 it was analyzed by the chemists of the North Dakota Agricultural Experiment Station, who reported that it "appears to be made from an inferior grade of honey, syrup of tar, chloroform, alcohol and morphin." The analyst noted that practically all the morphin was found not in the solution but in the sediment which was deposited on the sides and bottom of the bottle; yet the mixture was put up without a "shake" label! He concludes, "The dead fly found in the liquid could scarcely *merit the 'hearty approval of all physicians and medical experts'* which is claimed in the circular accompanying this remedy."

Vêritable Grains de Santê du Docteur Franck

Since the beginning of the nineteenth century, according to the descriptive leaflet, these "Grains of Health" have been preventing "typhoid congestions," and various other woes which arise from impaired intestinal functions. Their value is defined as "*stomachic and laxative, depurgative, purgative* and antiseptic." The "grains" were examined by the chemists of the Connecticut Agricultural Experiment Station, 1912, who reported that the pills appeared to be essentially aloes and cost at the rate of $33.19 a pound.

Dr. Bloomer's Catarrh Remedy

This preparation, hailing from Altoona, Ga., comes in cigarette form. Analyzed by the chemists of the North Dakota Agricultural Experiment Station it was reported to contain "*chamomile flowers* over 50 per cent., powdered cubeb, fennel seed and a few other powdered vegetable substances."

Schenck's Pulmonic Syrup

A sample of this "seventy-year-old Standard Remedy for Consumption, Coughs, Colds, Diseases of the Lungs and Respiratory Organs," was analyzed by the chemists of the Connecticut Agricultural Experiment Station, who reported: "This remarkable remedy for consumption is essentially a winter-green-flavored mixture of saccharin syrups, 96.4 per cent. of the solids consisting of sugars. It is hard to believe that the virtue of this material rests in the 2.7 per cent. of undetermined solids (possibly vinegar of squills). It is recognized that a rich and nutritious diet is essential in the treatment of consumption, and it is true that this substance, with nearly 73 per cent. of sugar, is highly nutritious, and yet one can scarcely recommend the purchase of such a preparation at the rate of $2.50 a quart, when molasses is obtainable at 50 to 60 cents a gallon."

Dr. J. H. McLean's Tar Wine Lung Balsam

"Will cure coughs, colds, bronchitis, consumption, asthma, throat and lung troubles," read the label; but, according to state chemists of North Dakota, analysis of this preparation would indicate that it "is nothing but a weak syrup of tar, containing about 15 per cent. by volume of ethyl alcohol." The examination is also reported to have shown that "the base of the preparation is not wine, as the label would lead one to believe." The report closes: "Thus the remedial agents in this preparation 'will cure consumption,' etc., are sugar and alcohol."

Dr. Gun's Pain Expeller

This product, which is said to be prepared by C. W. Beggs Manufacturing Co., Chicago, was declared misbranded by the Colorado State Board of Health in 1909. One of the reasons for this action on the part of the Colorado officials was that the stuff was labeled "free from any dangerous ingredients," when, as a matter of fact, it contained opium. The product was again examined by the chemists of the North Dakota Agricultural Experiment Station, who reported in 1911 that two bottles of the preparation, bought in different parts of the state, showed variation in the proportions of the ingredients. The product was found to contain alcohol varying in amount between 50 and 60 per cent. and to have from 1 1/5 to 1 3/4 grains of opium to the ounce, while the presence of camphor and capsicum was determined.

Correspondence

Origin of the Sign Which Stands for Recipe

To the Editor:—In view of the general interest in the question of the origin of the sign placed at the head of a prescription, I wish to put before the readers of The Journal an opinion which I have obtained from O. F. Long, professor of Latin, Northwestern University. The following correspondence will make the matter clear.

Hugh McGuigan, M.D., Chicago.

Dear Professor Long:

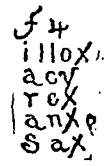
A prescription commences with the symbol ℞, representing the Latin word *recipe.* The origin of the ligature is a source of discussion and confusion to many. Most books on prescription-writing state that in ancient times it was the custom to preface a prescription with a pious invocation to Jupiter, or some guardian deity. The prayers finally became abbreviated until they were expressed by ♃, the astronomical sign for Jupiter. The ligature or stroke across the letter ℞, which heads the modern prescription, is said to be a relic of this heathen custom.

Is there any basis for this teaching? Some recent writers state that it is merely a sign of abbreviation used by writers of Latin manuscripts. Very few, if any, medical writers are qualified to pass an opinion on this subject; if therefore it does not involve too much time on your part, I should like to have your opinion on it.

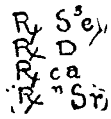
Hugh McGuigan.

Dear Dr. McGuigan:

The abbreviations used in Latin manuscripts go back, of course, to various origins, and various methods are used. There is an ancient system of shorthand writing known as Notae *Tironianae* which is responsible for some of the kinds of abbreviations used. The particular abbreviation represented by this ligature is not uncommon for various endings, as the following words may illustrate:

Word	Abbreviation
Feria	
Illorum	
Accipe	
Rerum	
Anus	
Sarisburia	

In the "Dizionario di Abbreviature latine ed italiane," by Adriano Cappelli, published at Milan, second edition, 1912, there are various abbreviations reported from Latin manuscripts that illustrate these points, and I select from *pp.* 322 and 323 the following that will be of particular interest in this connection:

Word	Abbreviation
Respondere	
Reverendo Domino	
Rubrica	
Reverendi	

The exact word which we are after, "recipe," is abbreviated on p. 323 as follows, Rec, and is noted as a medical term. You will see that here the ligature is *not* used. This is precisely what we find to be the case in all of these abbreviations under the letter R, regardless of the meaning of the word. Sometimes the stroke is put across the tail of the R. and sometimes not. I do not believe that the facts afford any basis for the theory of an invocation to Jupiter.

O. F. Long.

The Cross-Roads Surgeon

To the Editor:—I have been very much interested in the discussion of the paper on "Posterior Gastrojejunostomy in Acute Perforative Ulcer of the Stomach and Duodenum," presented by Dr. John B. Deaver at the Minneapolis meeting of the American Medical Association. While I fully realize the necessity of emphasizing the responsibility assumed in attempting to operate in cases of this character, I regret the somewhat personal character of the discussion when reference was made to cross-roads surgeons. Less than a century ago the superstition was prevalent that all major operations must of necessity be performed in a hospital ward; later, that a celiotomy must of necessity go to Philadelphia; and subsequent to this, that only large cities and extraordinarily well-equipped hospitals could be used for performing these grave operations. However, modern surgery of the best and most successful type is being done by these cross-roads surgeons who are criticized in this discussion.

The statement that great operations should be performed only by those surgeons who have spent much time in fitting themselves for this work sounds very well, but where can a surgeon qualify if he does not develop the resources at hand? And what will the public do when all those now fitted to perform these operations are dead?

The gist of the discussion, with which I fully agree, is that anyone who undertakes operations of this character must be honest with himself and must have sound judgment, which he should carefully exercise in the interest of his patients. Many of the so-called cross-roads surgeons have this quality, and are honestly working in the best interest of their patients, while they are developing with the experience that comes to them. The point I would make is that not all physicians of ability live in the city, there are some at the cross-roads.

Paul Peniston, M.D., Newnan, Ga.

Need for Inexpensive Obstetric Nurses

To the Editor:—Something should be done to enable women of scanty means to receive decent care during confinement. Everything is being done in the way of intelligent care for the women who are giving birth to illegitimate children. This is as it should be, for although it is a stain on the woman's virtue, she is not so vile as the married woman who murders her offspring in her womb. The honest wife of the working man has to "grunt and sweat under her heavy load" and if she dies for want of care the blame is unjustly placed on Providence. Trained nurses cannot be obtained for the wife of the working man because the mainstay of the family cannot pay the price. There should be training schools for women who would devote their work to taking care of the working man's wife, during confinement, at a reasonable charge. The time for such study should not be longer than six months and the work taken up by widows or women over 30 years of age. Giving birth to a child is purely physiologic. In the greater number of cases a thorough knowledge of cleanliness is all that is necessary. Nowadays if the wife of the working man receives the necessary care she is saddled with a load of debt, so that her husband looks on his wife's pregnancy as a domestic calamity. In no other condition is common sense, combined with intelligent skill, so necessary. Less pawing and mauling of the woman is desirable. Meddlesome interference has laid many a woman in the cold ground. Six months' training for nurses in a lying-in hospital is sufficient for such work. The honest wife of the poor man should receive at least the same care as her erring sister.

E. T. Milligan, M.D., Detroit.

A Ratless Utopia.—A ratless country seems almost utopian, but much can be accomplished in preventing the unnecessary loss and in safeguarding the country from any possible plague invasion, by a concerted and well-sustained nation-wide crusade against the rat, similar to the "swat the fly campaign." No sporadic or individual effort will suffice.—R. H. Creel, *Pub. Health Rep.*

Medical Economics

This Department Embodies the Subjects of Post-graduate Work, Contract Practice, Legislation, Medical Defense, and Other Medicolegal and Economic Questions of Interest to Physicians

CONTROL OF CANCER

The American Society for the Control of Cancer is a recently organized body, consisting of both laymen and physicians. Its object is the education of the public on the controllability of cancer through early diagnosis and operation. Mr. George C. Clark of New York is president. Mr. Thomas M. Debevoise, 62 Cedar Street, New York, is secretary, and Dr. Clement Cleveland of New York is chairman of the executive committee. The society has recently issued a statement to the press, setting forth its aims and plans, from which the following is abstracted:

It has long been known that cancer was one of the most frequent causes of death, but only in recent years have data been available to prove the frequency of the disease and its high place in the mortality of the human race.

In a recent paper before the American Gynecological Society, an eminent authority—a statistician of a great insurance company—brought together in the most convincing way the statistical evidence, not only of the frequency of cancer, but of its increasing frequency. From these figures it would seem that at ages over 40 cancer is a greater menace to human life than tuberculosis.

The many agencies which have been working for years to protect the health of the people have undoubtedly increased the probability of a longer life. This, in itself, increases the chances of cancer. During the last few years there have been efforts to educate the medical profession and the public as to the frequency of cancer and as to its greater curability when recognized early and properly treated. The American Medical Association appointed, some years ago, active committees on public health and education, and one of these had a subcommittee whose function it has been to deal with the question of cancer. Other medical associations have also appointed special committees to investigate the problem of the best method of educating the public and the medical profession.

In the spring of this year a number of lay women and men, with the advice and encouragement of members of the medical profession, conceived the idea of a national association for the control of cancer. This association has now been established. Its incorporate name has been selected—the American Society for the Control of Cancer. The word "control" was employed because the world should know that the medical profession has accumulated the facts which will prove that the menace of cancer can be controlled. At the recent meeting of the American Medical Association a resolution was unanimously adopted endorsing the organization and objects of the American Association for the Control of Cancer. There seems little doubt that every medical society will do likewise.

This beginning is but a small part of the great and difficult work before the new association. At present the facts well established in regard to cancer are not known by the people or even by the great body of the medical profession. They must be presented in such a way that there shall be no doubt in regard to their authenticity and truth. The conclusions must be those agreed on by the great majority of those who have for years studied the problem of cancer and accumulated this evidence. The truth must be presented to the people in such a way that it will not create fear, but confidence. The message to the medical profession will be equally difficult. The diagnosis of cancer in its earliest stages, when treatment gives the best results, is more uncertain, and the treatment in this stage, although less dangerous, is a more delicate surgical procedure.

Less thought has been given to the practical treatment of the cancer problem than to any other of the great problems of public health. Few have known of the great menace of cancer, as compared with tuberculosis and typhoid fever, or of the number of cures of cancer in its later stages. Fewer have known of the tremendous possibilities of increasing the number of cures when cancer is recognized and properly treated in its earliest stages. Evidence seems to prove that the control of cancer is simply a problem of education.

17 Country School Sanitation. F. G. Blair, Springfield.
18 Illinois City Tuberculosis Act. T. B. Sachs, Chicago.
19 Methods of Control of Tuberculosis. S. M. Miller, Peoria.
20 Status of Vital Statistics in Illinois and Our Obligations. T. H. D. Griffitts, Springfield.
21 Danger Signals in Suppuration of Middle Ear. J. Hollinger, Chicago.
22 Intermittent Claudication, Necessitating Amputation: Two Cases. L. Feingold, Chicago.
23 Mitral Stenosis Complicating Pregnancy. S. E. Munson, Springfield.
24 *Wassermann Test. F. Baumann, Chicago.

24. **Wassermann Test.**—The Wassermann test, Baumann asserts, is not a specific reaction for syphilis, but on account of the mildness of the invader it shows up stronger in syphilis than in any other disease. But every disease that causes the appearance of disease products in the blood of the patient will for the time being also give some degree of Wassermann reaction. Experiments which he has been making force him to the conclusion that this test is, furthermore, mainly a group reaction, a non-specific group reaction, and that it is in exceptional cases only that we shall be permitted to exclude any of the factors aiding in the shaping of the final results of this reaction. One factor of the group, namely, the native antisheep "amboceptor," can be excluded from influencing the final result of the test by using an antihuman instead of an antisheep hemolytic system. A number of investigators are advocating such a change of the indicator. The amount of native antisheep amboceptor varies in different individuals, according to their surroundings, and in the same individual according to his general state of health. Syphilis as well as other diseases that depress the state of health for any length of time depresses the amount of native amboceptor. By using an antihuman hemolytic system as an indicator, there is eliminated, therefore, a symptom that may occur in other diseases, but at the same time there is excluded a symptom that does occur in syphilis. The substitution, therefore, of an antihuman indicator for an antisheep indicator deprives the test of a good deal of its sensitiveness. Comparative work with these two hemolytic indicators convinces Baumann that the exclusion of the antisheep amboceptor is desirable and helpful in arriving at a valuable clinical result only in exceptional cases.

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25 *Histogenesis of Multiple Carcinoma of Skin. L. Loeb and W. O. Sweek, St. Louis.
26 *Studies in Anaphylaxis. R. Weil, New York.
27 *Complement Content of Blood in Malignant Disease. T. Ordway and E. Kellert, Boston.
28 *Factors in Production and Growth of Tumor Metastases. E. E. Tyzzer, Boston.
29 *Protein Metabolism in Certain Tumor-Bearing Rats. T. Ordway and J. L. Morris, Boston.
30 Complement Fixation in Glanders. L. Frothingham and S. O'Toole, Boston.
31 *Complement Fixation in Syphilis with Spirochaeta Antigens. J. A. Kolmer, W. W. Williams and E. E. Laubaugh, Philadelphia.
32 *Wassermann Reaction with Normal Rabbit Serum. J. A. Kolmer and A. J. Casselman, Philadelphia.
33 Investigation of Origin of Immune Serum Necrosis of Liver. H. T. Karsner and J. C. Aub, Boston.
34 *Control of Infectious Diseases by Protective Inoculation. P. H. Hiss, New York.

25. **Multiple Carcinoma of Skin.**—Loeb and Sweek come to the following conclusions: The formation of multiple carcinoma of the skin depends on a primary increase in activity of certain parts of the epidermis. It is an affection of the epithelial cells independent of proliferative changes or of collections of round cells in the connective tissue, and independent of attractive influences of blood-vessels. The proliferative energy of the epithelium which leads to the formation of the multiple carcinoma is relatively small. The infiltrative power of the proliferating epithelium is equally slight. In consequence of this slight infiltrative power there may be an outgrowth of epithelium into the air instead of a downgrowth into the underlying cutis. In a certain relationship to the deficiency in proliferative and infiltrative power stands perhaps the inability of the proliferating epithelium to undergo the normal metamorphosis of the surface epithelium into keratohyalin and into keratin. As to the cause for the multiple proliferation of epithelium over a certain area of the skin, no definite statement is made by the authors. They say that we may have to deal with a primary stimulation of the epithelium. It is, however, also thinkable, that the pathologic changes found in the skin, especially in the connective tissue, may have entailed an abnormal metabolism of the skin leading to the production of substances exerting a stimulating effect on the proliferative energy of the epithelium at various places. It is furthermore conceivable that in addition slight external stimuli of a more accidental character, as for instance mechanical pressure, the influence of light, Roentgen rays or changes in temperature, may, in such a prepared soil, decide why certain parts of the diseased area become affected and show a proliferation of the epithelium at a time when in neighboring parts the epithelium is still in a resting condition. This suggestion is, of course, of a purely hypothetical character at present. On the other hand, it is not very probable that the changes in the connective tissue which were found led to a decrease in the mechanical tension, under which the epithelium lives normally. On the contrary they notice that the connective tissue resists very successfully at various places the increased tendency of the epithelium to grow downward.

26. **Anaphylaxis.**—Weil believes that guinea-pigs may be sensitized to a foreign protein (sheep-serum or rabbit-serum) by the repeated injection, on successive days, of massive doses (3 c.c.) of the foreign protein. The guinea-pigs become hypersensitive approximately eight days after the last dose. They differ in no essential particular from guinea-pigs sensitized in the usual fashion by a single small dose. The minimal lethal dose in guinea-pigs prepared by a series of injections is found to be larger than in those prepared in the usual fashion. This is attributed to the fact that their blood is very much richer in immune bodies, as is herein experimentally demonstrated. These experiments are offered as further evidence of the view that anaphylaxis and immunity are conditions which differ from each other only in the relative quantity of circulating antibody.

By means of preliminary treatment with normal rabbit-serum a guinea-pig becomes altered in such wise that it is refractory to sensitization by immune rabbit-serum. The effectiveness of this preliminary treatment depends on two factors: the amount of normal rabbit-serum administered, and the length of the interval between the preliminary and the sensitizing injections. The time during which passive sensitization persists, after having been induced by heterologous immune serum, may be shortened by the preliminary, or subsequent, injection of normal heterologous serum of the same species. The preliminary injection of sheep-serum protects guinea-pigs, in a certain proportion of cases, against the sensitizing effect of immune rabbit-serum. This effect is much less regular and pronounced than when rabbit-serum has been used for the preliminary injection. For these facts the following conclusions are drawn by Weil: First, that protection against sensitization, as before described, is due to immunization of the guinea-pig, with neutralization of the antibodies contained in the immune serum subsequently introduced. Second, that it is therefore possible to induce immunity toward specific heterologous antibodies by means of the injection of a normal heterologous serum. Third, that this immune reaction occurs earlier than does anaphylaxis, and that it is also more delicate, in that it indicates the presence of a group reaction, or immunization, which is not revealed by the latter method. Fourth, that the duration of passive sensitization, when induced by the injection of heterologous immune serum, is in all probability determined by the time necessary for the development of an immunity to the introduced foreign serum.

By the injection on several successive days of large doses of normal rabbit-serum it is regularly possible to protect guinea-pigs against the sensitizing action of immune rabbit-serum. This protection may be manifest within one or two days after the preliminary treatment has ended, and continues for at least two weeks longer. After sensitization of the guinea-pig by means of the injection of immune rabbit-serum has been established, it is possible to terminate this before its normal time of disappearance, by means of the injection on several successive days, of large doses of normal rabbit-serum. It is regularly possible to protect guinea-pigs by the repeated injection of large doses of normal sheep-serum against the sensitizing effect of immune rabbit-serum. Sensitization by immune rabbit-serum may be abolished as in two, by the subsequent injection of sheep-serum in repeated large doses. The conclusion is drawn that these phenomena, provisionally described as "saturation" and as "displacement," are probably due to the immunization of the guinea-pig, either directly (by rabbit-serum) or indirectly (by sheep-serum) against the immune rabbit-serum. This view is supported by the conclusions drawn from the two earlier studies included in this paper. Animals actively sensitized against horse-serum cannot be desensitized by repeated injections of sheep-serum. Passive sensitization by homologous immune serum in guinea-pigs has not been prevented by previous treatment with sheep-serum or guinea-pig-serum. Weil believes that these results confirm the view that the phenomena of saturation and displacement are to be explained on the basis of immunization against introduced heterologous antibodies.

27. **Complement Content of Blood.**—The hemolytic complement content of the blood-serum in different varieties and stages of human cancer in the majority of cases was found to be relatively constant by Ordway and Kellert. The amount is practically the same as that found in health and in persons suffering with certain other diseases. Such human serum (in most cases) contains one-tenth to one-twentieth as much hemolytic complement as pooled serum from adult guinea-pigs. There is no increase of hemolytic complement in myelogenous or lymphatic leukemia. The hemolytic complement content in the plasma of citrated human blood does not differ from that in the serum.

28. **Production and Growth of Tumor Metastases.**—The course of procedure to which the patient is frequently subjected—the palpation of the mass in question in repeated physical examinations, the violent scrubbing often employed in preparing the field of operation—is almost identical with that which Tyzzer employed for the experimental production of metastasis. He emphasizes that it would be of advantage to the patient if each questionable tumor of the breast, for example, could be regarded as a high explosive, the least manipulation of which should be absolutely avoided both prior to and during the operation. It is not improbable that by this means metastasis and extension beyond the field of operation could be prevented and the percentage of cases cured by operation increased. From the point of view of metastasis it would appear from Tyzzer's results much less serious to cut into a tumor than to exert pressure on it, although the effect of the distribution of tumor tissue throughout an extensive operation is quite generally understood. It is not improbable that the removal of a tumor of large size from which metastasis has alrady occurred results in a more rapid growth of the secondary deposits. This should not weigh too heavily, however, in considering palliative operations of this sort, for internal tumors not being under the direct observation of the patient furnish a less constant source of apprehension, and the removal of a large external tumor may make the case much easier for the physician to manage.

Operations incomplete but involving the incision of implanted tumors do not increase the incidence of metastases, but these grow more rapidly as the result either of an increase in the amount of food material made available by the removal of a large mass of tumor tissue elsewhere (athrepsia) or of the elimination of the element of cachexia and improvement of the physical condition which almost invariably occurs. Radical operations involving the removal of all the tumor—except minute masses which subsequently come into evidence along the path of the inoculating trochar—if performed just prior to the period in which metastasis commences, results in a temporary freedom from this complication even though recurrence commonly occurs. Metastasis may be artificially produced by the manipulation and massage of the implanted tumor. This is accomplished as readily during the early development of the tumor as in the period in which metastasis naturally occurs.

The production of metastases is dependent on certain demonstrable factors—the biologic character of the tumor, the duration of its growth, the size of the primary mass, possibly peculiar conditions furnished by the host tissues, and, under artificial conditions, forcible manipulation. The so-called "pre-metastatic period" is better accounted for by an absence of the conditions necessary for the dissemination of tumor cells than by a phase of "active resistance" during which the further development of tumor emboli is prevented. By the early artificial dissemination of tumor cells by the manipulation of the primary tumor, this period may be greatly shortened.

29. **Protein Metabolism in Rats.**—The protein metabolism of certain tumor-bearing rats as indicated by the examination of the urine by Ordway and Morris differed from normal controls in regard to elimination of uric acid, which is markedly increased, especially when the tumor is growing rapidly. There is also a distinct increase in creatin and a diminution in creatinin in these tumor-bearing animals.

31. **Complement Fixation in Syphilis.**—Serums of normal persons and normal rabbits as well as serums of persons suffering with diseases other than syphilis and yielding negative Wassermann reactions, the authors found do not contain substances capable of fixing complement with *pallida* antigens. About 50 per cent. of serums from persons in all stages of syphilis and giving positive Wassermann reactions and luetic histories reacted negatively with *pallida* antigens. Two cases of primary syphilis were negative; of twenty-three cases of secondary syphilis, 30 per cent. reacted positively: of fifty-eight cases of tertiary syphilis, 48 per cent. were positive, as were two of three cases of hereditary syphilis. In every instance the degree of fixation with the *pallida* antigen was much less than with the stock lipoidal extracts and in only one case of secondary syphilis treated with mercury was the reaction positive with the *pallida* and negative with the stock antigens. The reaction with the *pallida* antigens are weak and too inconstant to be of routine practical value. Serums of rabbits immunized with pure cultures of *Spirochaeta pallida* yielded strong reactions with the *pallida* antigens. As controlled by the examination of one hundred normal rabbits these serums also gave positive reactions with stock lipoidal extracts.

Many of the human serums and all the rabbit immune serums were likewise tested with control antigens of sterile culture mediums, pure washed cultures of typhoid and cholera bacteria as well as cultures of these organisms in the same culture mediums as used in the cultivation of *Spirochaeta pallida*. With the human serums a few doubtful reactions were obtained with the antigens of sterile mediums and more marked reactions with the typhoid and cholera culture medium antigens. The rabbit immune serums not only reacted strongly with these antigens but likewise yielded weak reactions with antigens of washed typhoid and cholera bacteria. From the fact that a lipoid was demonstrated in these antigens it may be that the non-specific reactions were due to the usual union of lipoid and lipoidophilic antibody, although the authors are unable to explain at present why this is especially true with the rabbit-immune serums. From the fact that the reactions with alcoholic extracts of pure washed spirochetes were uniformly negative it is apparent that the antigenic principle of the spirochete is not readily abstractable in alcohol, the aqueous extracts being preferable in complement fixation reactions.

32. **Wassermann Reaction with Rabbit Serum.**—In these experiments a percentage of serums of normal rabbits yielded positive complement fixation reactions with lipoidal extracts. With aqueous and alcoholic extracts of *pallida* as antigen fixation did not occur. With acetone extracts of syphilitic liver no fixation was found when using 0.05 and 0.1 c.c. of serum; with 0.2 c.c. serum fixation occurs in 10 per cent., and with 0.4 c.c. in 31.3 per cent. of normal rabbit-serums.

With alcoholic extracts of syphilitic liver fixation did not occur with 0.05 c.c. serum; when using 0.1 c.c. fixation occurred in 13.3 per cent.; with 0.2 c.c. in 20 per cent.; and with 0.4 in 27.5 per cent. of normal serums. With extracts of the acetone insoluble lipoid fraction fixation did not occur with 0.05 and 0.1 c.c. of serum; with 0.2 c.c. fixation occurred in 33.1 per cent., and with 0.4 c.c. in 55.7 per cent. of normal rabbit serums. An alcoholic extract of beef heart reenforced with cholesterin showed the highest percentage of positive reactions. With 0.05 c.c. serum fixation did not occur; with 0.1 c.c. fixation occurred in 20 per cent.; with 0.2 c.c. in 40 per cent., and with 0.4 c.c. in 50.8 per cent. of normal rabbit serums. The occurrence of positive complement-fixation reactions with normal rabbit serums and lipoidal extracts bears no relation to coccidiosis. While the cause of this phenomenon is as yet unexplained it is probably due to the presence in rabbit-serum of a lipoidophilic substance with affinity for certain lipoids or lipoidal substances.

34. **Control of Infectious Diseases.**—Hiss outlines briefly the result of the treatment of infections in animals with leukocyte extracts. These infections or poisonings have usually been brought about by intravenous inoculations, and, as a rule, the treatments with extract have been injected subcutaneously, although at times intraperitoneally. Animals receiving subcutaneous injections of rapidly fatal doses of *Staphylococcus pyogenes aureus* can generally be saved by treatment with the extract of normal leukocytes of rabbits even in small doses, especially when these are given intraperitoneally. When intravenous injections of staphylococcus are practiced, the results are different, but treated animals usually survive the controls many days and present modified histologic pictures. In streptococcus infections there was a marked lengthening of life and even a survival of the treated animals, and better results in the animals treated early than in those treated late. All of the animals which lived long enough developed articular or periarticular lesions. Pneumococcus infections surely fatal in untreated rabbits, become significantly modified in treated animals, even if this treatment be delayed many hours. In typhoid infections the animals receiving protection with leukocyte extract, shortly after this treatment, usually seemed worse than the control, and to the inexperienced would appear the most likely to die. But leukocyte extracts have a remarkably beneficial modifying action on the course of typhoid infections or poisonings in rabbits. Severe tests and experiments with meningococcus infection point strongly to the value of leukocyte extract in the treatment of this infection.

The points which Hiss says speak most strongly for the explanation of the beneficial action of leukocyte extracts, as either poison-neutralizing or poison-prohibiting, rather than primarily bactericidal or bacteriolytic, or even one of the immediate phagocytosis, are first, the effect on temperature; for, when the temperature is high it tends to be lowered, and when it is falling below normal from the intensity of the poisoning it tends to rise on treatment; which is a sign, of course, under this condition, of returning strength on the part of an animal; and secondly, the effect in preventing diarrhea, which is a symptom of poisoning in such intoxications.

Journal of Outdoor Life, New York

August, X, No. 8, pp. 224-254

35 Getting Together for Results. F. E. Crowell, New York.
36 Cooperation of Tuberculosis Agencies with Labor Unions and Factories. J. R. Shillady, Buffalo.
37 Cooperation through Private to Governmental Agency. F. E. Wing, Chicago.
38 National Bureau of Tuberculosis Legislation. R. H. Bishop, Cleveland.

Journal-Lancet, Minneapolis

August 1, XXXIII, No. 15, pp. 419-444

39 Teaching of Hygiene and Preventive Medicine in Medical Schools. J. L. Heffron, Syracuse, N. Y.
40 Surgical Treatment of Hyperthyroidism. C. Nootnagel, Minneapolis.
41 Therapy of Hyperthyroidism. H. A. H. Bouman, Minneapolis.
42 Medical Defense. R. H. Bosard, Minot, N. Dak.
43 *Danger from Bone Filings. R. E. Farr, Minneapolis.
44 *Sounding-Board as Aid in Diagnosis of Diseases of Chest. J. E. Engstad, Minneapolis

43. **Danger from Bone Filings.**—January 23, the humerus of Farr's patient was plated after two unsuccessful attempts at reduction, with the patient under ether, had been made. During this operation no special precautions were taken to prevent the "bone dust" from being scattered over the exposed muscles while the bone ends were being sawed off in preparation for the plating. When the second operation was performed for the purpose of liberating the musculospiral nerve from the callus, the Lane plate which was placed on the bone was found completely buried in callus to the depth of 1 cm. The brachialis anticus and triceps, contiguous to the bone, were infiltrated with new bony tissue over an area measuring approximately five inches in length. Farr believes that this condition was evidently due to the scattering of osteogenetic elements over the exposed muscles at the time of operation, as only the portions of the muscles exposed at operation were involved. The overgrowth of bone and the bone plate were removed, and a strip of the triceps was wound about the humerus. A small amount of motion still remained. Great care was used in liberating the musculospiral nerve, which was first identified at the lower angle of the wound.

44. **Sounding-Board in Diagnosis of Diseases of Chest.**—The sounding-board used by Engstad is three feet wide by five feet high, made from two piano sounding-boards, the boards being set four inches apart in a hardwood frame properly fastened with glue and avoiding nails or other metallic reinforcements. The boards are braced in their center by a bridge of hardwood, and the front board has two holes two inches in diameter bored through it, which tends to equalize the pressure of the air between the boards and frame while in a state of vibration and the circumambient air, which is the cardinal principle for the proper reflection and reinforcement of the air-waves, or energy in the form of vibrations.

This apparatus, Engstad says, will markedly intensify all sounds from the chest-walls, and it has been of great service to him in suspected small cavities, deposits and small infarcts in the chest which are revealed by the reinforced vibrations as reflected from the sounding-board, which prevents the sound waves from disappearing in space, but are reflected redoubled in the angle of the impact.

Kansas Medical Society Journal, Kansas City

July, XIII, No. 7, pp. 265-304

45 Modern Methods in Diagnosis of Syphilis. H. M. Conner, Topeka.
46 Obstruction of Upper Respiratory Tract. J. R. Scott, Newton.
47 Present Approved Methods of Treatment of Obstructions to Lacrimonasal Duct. E. N. Robertson, Concordia.
48 Importance of Inspection and Standards for Medicinal Substances. L. E. Sayre, Lawrence.

Laryngoscope, St. Louis

July, XXIII, No. 7, pp. 721-800

49 Recent Progress of Endoscopic Methods as Applied to Larynx, Trachea, Bronchi, Esophagus and Stomach. C. Jackson, Pittsburgh.
50 Removal of Foreign Bodies from Upper End of Esophagus. R. H. Johnston, Baltimore.
51 Brief Pathologic Study of Papillomas with Reference to Their Existence within Nose. R. B. Scarlett, Trenton, N. J.
52 Suggestions in Acoumetry. G. Gradenigo, Turin, Italy.
53 Treatment of Persistent Otorrhea in Infants and Young Children by Establishment of Postauricular Drainage. W. C. Phillips, New York.
54 Differential Diagnosis and Treatment of Acute Labyrinthitis. L. L. Henninger, Council Bluffs, Ia.

Missouri State Medical Association Journal, St. Louis

July, X, No. 1, pp. 1-42

55 Making of a Surgeon. F. G. Nifong, Columbia.
56 Question of Prevention of Insanity, and State Hospitals and How They May Be Improved. M. P. Overholser, Harrisonville.
57 Endometritis. J. F. Mackey, Odessa.

New Jersey Medical Society Journal, Orange

July, X, No. 2, pp. 55-108

58 Mechanistic Theory of Disease. G. W. Crile, Cleveland.
59 Privileged Communication. W. J. Chandler, South Orange.
60 Idealism in Medicine. W. P. Eagleton, Newark.

August, No. 3, pp. 109-166

61 *Pneumonia in Infancy and Childhood. J. F. Bell, Englewood.
62 Acute Lobar Pneumonia in Adult Life. A. C. Zehnder, Newark.
63 Complications of Pneumonia. P. H. Markley, Camden.
64 Pathology of Pneumonia. A. B. Davis, Camden.
65 *Treatment of Acute Lobar Pneumonia. P. Marvel, Atlantic City.

61. **Pneumonia in Infancy and Childhood.**—The treatment of pneumonia in children, Bell says, should be simple but carefully and individually directed, and laid out under the following four heads: 1. Medical (a) Cathartics.—Bell finds it generally a good plan to empty the intestine with either castor oil, calomel with milk of magnesia or podophyllin and soda. (b) Sedatives.—Sedatives are serviceable for pain and harassing cough. Paregoric is specially suitable for this purpose; codein and heroin may be used, the less of either the better. (c) Stimulants.—When stimulants are necessary Bell uses caffein for the low muttering delirious cases. Alcohol freely even in babies, and in a serious crisis digalen intravenously. Following Sajous' suggestion, he has used in a few cases 5 c.c. doses of normal salt solution every two hours, adding orange juice and egg white occasionally. (d) Serum therapy.—He has used anti-pneumococcus serum in two cases. In one of these antistreptococcic serum was used in conjunction, because streptococci were abundant in the sputum. Large doses were given and the patient did well. It follows that the earlier the serum is given the better the opportunity for favorable action. 2. Hydrotherapeutic.—Sponge baths of water at 21 C., 32 C. or 41 C. (70-90-106 F.). Bell usually begins with temperature 32 C. (90 F.) to 40 C. (104 F.). 3. Dietetic.—The diet must be selected in accordance with age and needs of the child. 4. Hygienic.—Bell has found it advantageous to treat all his pneumonias more or less in the open air.

65. **Treatment of Acute Lobar Pneumonia.**—The treatment which in Marvel's opinion promises most for the reduction in the mortality of pneumonia must be along the line of antipneumococcic serum. It has already been found that an antipneumococcic serum prepared by immunizing dogs with increasing doses of pneumococci obtained by lung puncture in cases of pneumonia will protect mice from a fatal outcome when inoculated with the same pneumococcus in sufficient dose to cause death in control animals, and various serums have been and are now being tried with some degree of success, but limited no doubt by the fact that there are so many different strains of pneumococci that it has seemed impossible to produce a serum that would be helpful in all cases, and there is, of course, no time to produce a serum in each case from the infecting organism.

New Mexico Medical Journal, Las Cruces

July, X, No. 4, pp. 89-112

66 Diabetes Mellitus. C. M. Yater, Roswell.
67 What Next? E. D. Strong, El Paso, Texas.
68 Gonorrheal Urethritis with Complications. J. J. Walker, Dexter.

New Orleans Medical and Surgical Journal

July, LXVI, No. 1, pp. 1-91

69 Eugenics in Its Relationship to Welfare of Public. T. B. Futcher, Baltimore.
70 What General Practitioner Should Know About Gonorrheal Iritis. R. L. Harrell, Alexandria, La.
71 Acute Pharyngeal Tonsillitis (Acute Adenoiditis). H. Dupuy, New Orleans.
72 Some Remote Effects of Chronic Sinus Suppuration. R. C. Lynch, New Orleans.
73 Symptoms and Diagnosis of Diphtheria. L. J. Menville, Houma, La.
74 New Technic for Intravenous Injection of Neosalvarsan. A. H. Cook, Hot Springs, Ark.
75 Surgical Aspects of Goiter. U. Maes, New Orleans.
76 "Peliosis Rheumatica." J. E. Landry, New Orleans.
77 Einhorn Duodenal Tube and Its Uses. S. K. Simon, New Orleans.
78 Relations That Should Exist between Surgeon and Anesthetist. A. M. Caine, New Orleans.
79 Review of About 650 Anesthesias. E. L. King, New Orleans.
80 Use of Heated Ether Vapor as Anesthetic. H. E. Nelson, New Orleans.

Pennsylvania Medical Journal, Athens

July, XVI, No. 10, pp. 763-846

81 Rules and Regulations Governing Examination. J. M. Baldy, Philadelphia.
82 Important Points of Medical Ethics. G. W. Simpson, Mill Creek.
83 Lessons and Reminiscences of Forty Years of Active Practice. O. H. Rockwell, Monroeton.
84 Use of Roentgen Rays in Neurology. G. E. Pfahler, Philadelphia.
85 Motion-Picture Demonstration of Nervous and Mental Diseases. T. H. Weisenburg, Philadelphia.
86 Isolated Case of "Trichiniasis." A. E. Blackburn, Philadelphia.
87 Surgical Aspects of Furuncles and Carbuncles. P. G. Skillern, Philadelphia
88 Five Cases of Nephrolithiasis with Special Reference to Symptomatology. M. P. Warmuth, Philadelphia.
89 Treatment of Some Acute Ear Conditions by General Practitioner. C. C. Eves, Philadelphia.
90 Clinical Observations on Blood-Pressure. J. Daland, Philadelphia.
91 Need of Plan to Eliminate Mentally Unfit from Service in Transportation Companies. T. Diller, Pittsburgh.
92 The Old School and the New. N. C. Mills, Big Run.
93 Milk, in Its Relation to Disease, Especially Infant Mortality. T. H. Wertz, Hanover.
94 Plan for Placing Homeopathy on Proper Basis as Scientific Therapeutic Resource of Medicine. F. F. Casseday, Portland, Ore.

Public Health Journal, Toronto

July, IV, No. 7, pp. 395-440

95 Examination of Sputum in Ontario. C. D. Parfitt, Gravenhurst, Ontario.
96 Tuberculosis in Toronto. E. H. Dyke, Toronto.
97 Public Health Act of Ontario. J. W. S. McCullough, Ontario.
98 Trachoma. H. F. L. Taylor, Punjab.
99 Medical Organization during Rear-Guard Actions in Civilized and Savage Warfare. W. C. Beevor.
100 Serotherapy in Canada J. Grant.
101 Disposal of Garbage and Refuse in Towns. W. R. Hall, Chatham, Ont.

Wisconsin Medical Journal, Milwaukee

July, XII, No. 2, pp. 35-62

102 Treatment of Diphtheria Carriers by Overriding with Staphylococcus Aureus. W. F. Lorenz, Mendota, and M. P. Ravenel, Madison.
103 Eighteen Years' Experience with Drug and Liquor Habitués. A. M. Rogers, Oconomowoc.
104 What You Wear, Not Knowing It. Address to Nurses. H. M. Brown, Milwaukee.
105 Early Diagnosis of Gastric Carcinoma by Aid of Roentgen Ray. W. F. Hilger, Milwaukee.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Australasian Medical Gazette, Sydney

June 21, XXXIII, No. 25, pp. 587-614

1 *Hydatid Disease. J. Ramsay.
2 Deformity of Wrist Developed Ten Years after Accident. M. Herz.
3 Case in Which Round Worms Caused Symptoms Leading to Diagnosis of Appendicitis. D. Kelly.

June 28, No. 26, pp. 615-640

4 Bone and Joint Lesions and Their Treatment. H. G. Tymms.
5 *Three Cases of Surgical Interest. J. A. G. Hamilton.
6 Case of Multiple Pregnancy: Quadruplets. H. Peet.

1. **Hydatid Disease.**—Ramsay reports cases of hydatid disease occurring in the lung, liver, hernia, bile-ducts, mesoappendix, peritoneum, bladder, fallopian tube, posterior axilla, between the abdominal parietal muscles, neck, mediastinum, thyroid, femur and antrum of Highmore.

5. **Three Cases of Surgical Interest.**—Hamilton cites a case of cesarean section for eclampsia, one of post-puerperal inversion of uterus and another of omental adhesions causing unusual symptoms.

British Medical Journal, London

July 26, II, No. 2748, pp. 157-212

7 Medical History of Brighton and Neighborhood. W. A. Hollis
8 *Some Aspects of Internal Secretion in Disease. G. R. Murray.
9 *Gifts of Surgery to Medicine. B. Moynihan.

8. **Internal Secretion in Disease.**—Murray points out that as yet we are able to recognize with certainty only the maladies which are due to well-marked changes in the structure and function of these organs. He suggests that it is probable that some less definite forms of ill-health may also be due to variations in the activity of one or more glands, the significance of which we shall be better able to appreciate when our knowledge of their functions becomes more exact. What, however, is most desired is to find satisfactory means by which we can supplement deficient secretion on the one hand and control harmful overactivity on the other. He hints that in the light of further knowledge it may be possible adequately to supplement suprarenal insufficiency and so relieve the symptoms of Addison's disease. The treatment of exophthalmic goiter and acromegaly will become more satisfactory as more adequate methods of checking the abnormal flow of secretion are acquired, when it is to be hoped that surgical measures will become unnecessary. Pancreatic diabetes may also prove to be more amenable to treatment by

methods at present beyond our reach. Clinical medicine has already gained enormously from results obtained by experimental pathology, and Murray looks to the future with confidence for efficient methods of treatment within our reach.

In commenting on thyroidal insufficiency, he bids us note that whereas typical cases of established myxedema are strikingly characteristic, *the slight and early forms* of the disease may easily be overlooked. In middle-aged women who complain of lassitude, chilliness and other subjective sensations, associated with slight dryness of the skin, some loss of hair, and a little thickening of the subcutaneous tissues, or other signs of slight thyroidal insufficiency, it is necessary to remember that myxedema may be the explanation of the symptoms, though every one of them, taken separately, is so common and so trivial. He summarizes briefly the effects of the partial or complete failure of thyroidal hormones as demonstrated by the effects of disease or removal of the gland in man and animals, and includes a short historical review of the application of the knowledge so obtained to the treatment of thyroidal insufficiency, making a very modest reference to his own important share in this notable therapeutic advance. The first patient with myxedema which Murray treated is still alive and well, having been kept in health twenty-two years by this treatment, during which time she has taken liquid thyroid extract to an amount which in all is less than one gallon. The use of thyroid extract in various conditions in which there is no definite evidence of any deficiency in the thyroidal hormones makes another interesting section of the address, and the effects of hyperactivity of the thyroid gland, more especially as evidenced in the various degrees of exophthalmic goiter, are of the real importance which he attributes to them.

Murray points out some interesting associations of this disease, notably its relation to sugar tolerance and diabetes and to tuberculosis. He has found that pulmonary tuberculosis occurs but rarely in uncomplicated cases of exophthalmic goiter, and that when it does occur it is usually limited in extent and activity. This apparent resistance to infection he suggests is probably due to the increased activity of the metabolism of the tissues rather than to any direct action of the thyroid secretion. In commenting on the variability of the symptoms of Graves' disease, the occurrence of general and local crises was described by Murray. In the general crises almost all symptoms are aggravated, and the attacks may be alarming and dangerous. The explanation offered is that they are due to a sudden increase in the activity of the thyroid. The local crises may be described as cardiac, cutaneous, bronchial, gastric or intestinal, according to the organ or system mainly affected. To account for these local manifestations it is suggested that the thyroid secretion may contain different hormones capable of activating different organs. In reviewing the treatment of the condition of hyperthyroidism he speaks favorably of the application of suitable doses of Roentgen rays to the gland, and finds that the cutaneous and bronchial crises are generally controlled by belladonna in full doses and the gastric and intestinal crises by opium.

9. **Gifts of Surgery to Medicine.**—Moynihan points out that medicine in its quest of knowledge may rightly levy a tribute from every other science with which it comes into contact. Its doctrines and its practice are tested and may receive support or be refuted by work accomplished in other fields. Surgery in recent years has proved a powerful helpmeet not only in the elucidation of problems of internal medicine, but also by reason of the light it has brought to bear on the functions of many of the organs in the body. The experimental method, as a mode of inquiry, is not excelled in value by any other, and no experiments, Moynihan holds, can claim an equal rank with those which are a part of almost all surgical procedures. The chief glory of the surgeon comes from the dedication of his powers to the service of an individual; but there is a cause also to be served. In every operation something may be learned, not only of those disorders which call urgently for relief, but of other associated, or it may be separate, conditions which chance at the same moment to be present. The researches so carried out on a human patient are performed with a sterner sense of responsibility and with a graver ritual and are impressed by more relevant influences than attach to any other form of inquiry. Their results are accordingly of far higher value. Clinical research, when sedulously conducted and illuminated by the disclosures made on the operating-table, affords the most accurate of all methods of investigation into the diseases by which man is attacked. The succor of an individual should mean also the taking of a step forward in the solution or the better understanding of the manifold and perplexing problems of disease.

Indian Medical Gazette, Calcutta

July, XLVIII, No. 7, pp. 253-292

10 Some Unusual Forms of Parasite of Pernicious Malaria, Found at Endemic Blackwater Fever Center in Blood Smears from Certain Children. N. P. O. Lalor.
11 *Rough Clinical Method for Quantitative Estimation of Chlorids in Blood. A. W. Overbeck-Wright.
12 Serodiagnosis of Tubercle by Alexin Fixation. V. B. Nesfield.
13 Radio-Activity of Some Springs in Bombay Presidency and Baluchistan. H. Sierp.
14 Hints to Subassistant Surgeons and Others on Administration of Chloroform. B. Higham.
15 Malaria in Andamans: Fever with Jaundice Cases. J. M. Woolley.
16 *Ligation of Internal Iliac and Ovarian Arteries for Inoperable Carcinoma of Uterus, Combined with Curettage and Cautery. V. B. Green-Armytage.

11. **Estimation of Chlorids in Blood.**—The method used by Overbeck-Wright is based on the principle of diffusion. All that is required is a couple of dozen glass tubes of the diameter of a goose-quill, about 6 inches long and sealed at one end; a small wooden stand, like a test-tube stand, for holding the tubes; a vernier scale into which the tubes are clipped for the necessary readings to be made, and a Wright's pipet. Reagent: (a) Constituents: agar-agar (pulv.) 6 grains; silver chromate, 1 grain; glycerol (glycerin) ½ ounce; distilled water, 2 ounces. (b) *Preparation:* Mix the agar-agar and silver chromate thoroughly in a mortar, emulsify with the glycerol and then add the water, mixing carefully throughout. Transfer to a porcelain crucible and bring to the boil over a spirit lamp. Boil for five minutes and then fill into tubes. Allow it to set. Place 5 mm. (¼ inch) depth of the solution to be tested on the top of the jelly in one of the tubes and into eight other tubes fill in respectively 5 mm. (¼ inch) of salt solutions varying from 0.8 to 0.1 per cent., stand for fifteen minutes and then read off the depth of penetration into the jelly as shown by the decolorization, the rich pink of the silver chromate becoming a flaky white with chlorids. A comparison of the depth of penetration of the solution to be tested with that of the varying salt solutions gives one at once the percentage solution of chlorids. So far Overbeck-Wright has found that normal blood contains a 0.5 to 0.75 per cent. solution of chlorids in the plasma, and he dilutes the blood as a rule to 1 : 3, as he finds that a larger variation in the smaller percentages and less chance of error. A 6 per cent. solution of sodium citrate or a 3 per cent. solution of sodium oxalate may be used to prevent coagulation, but the latter is preferable. No more blood is required for this test than for a Widal's reaction and a mere prick of the finger as a rule gives ample amount for the test.

16. **Ligature of Iliac and Ovarian Arteries.**—Green-Armytage calls attention to an operation first suggested by Charles Ryall of the London Cancer Hospital, namely, tying of the internal iliac and ovarian arteries, the principle of the treatment being vascular starvation of the growth, and being based on the same principle as the occasional operation of ligation of the external carotids for the terrible sufferings of advanced cancer of the tongue. In the Eden Hospital, at Calcutta, when the cachexia and general condition of the patient prohibit laparotomy, it is the custom to use the sharp spoon thoroughly and afterward go over the bleeding surface with Paquelin's cautery, and then plug the cavity with tampons which have been soaked in a saturated solution of zinc chlorid and dried the vagina below being plugged with powdered soda and gauze. In three to five days the plugging is removed, and vagina douched daily until the sloughs separate. When, however, the patient's general condition is fair, pain is a marked symptom, or hemorrhage is severe, they have per-

formed Ryall's operation. During the last eighteen months nine patients have been operated on. At the end of the operation if the pulse is good. the patient is put in the lithotomy position, and the growth is dealt with as detailed above. If the patient's condition is not good, the growth is not dealt with till a week or ten days after the primary operation. There is usually a slight febrile reaction after the operation for a few days which Green-Armytage says need cause no alarm. The after results of the operation are astonishingly good.

The general health improves markedly, the pain subsides entirely, as the discharge ceases, and the growth of the cancer is retarded for a considerable time. The net result is that, though the days of the patient may not have been greatly extended, she is able to live in comparative comfort for a very much longer period than the usual lines of treatment permit. Three cases have been seen 7, 9, and 13 months after operation, comparatively well and with no symptoms beyond a discharge due to a slow recrudescence of the original tumor. In four cases in which vesical irritability was a marked feature of the disease, this symptom completely disappeared for many months. There has been no operation mortality.

Lancet, London

July 26, II, No. 4691, pp. 199-272

17 Some Aspects of Internal Secretion in Disease. G. R. Murray.
18 Gifts of Surgery to Medicine. B. Moynihan.
19 Arsenic Cancer. (To be continued.) W. H. Nutt, J. M. Beattie and R. J. Pye-Smith.
20 *Contamination of Thoracic Cavity and Its Contained Lymph-Nodes Follows Infection of Peritoneal Cavity. C. C. Twort.
21 Use of Arsenical Compounds for Syphilitic Disease of Nose and Throat. H. L. Whale.
22 Early Diagnosis of Case of Leprosy Much Assisted by Roentgen Rays. T. Miller, Manitoba.
23 Decalcifying Action of Oxalic Acid. H. J. B. Fry.

20. **Contamination of Thoracic Cavity.**—The inoculation of a certain quantity of oil into the peritoneal cavity to prevent any absorption of septic material has been recommended and has been practiced fairly extensively, especially by continental surgeons. A few experiments bearing on this question were also performed, oil being inoculated from fifteen minutes to twenty-four hours before the injection of the bacilli. Although the number of experiments in this direction have not been numerous, Twort says, they demonstrate clearly that the oil does not prevent the escape of bacteria from the peritoneal cavity and their absorption by the thoracic glands, and it is doubtful if it in any way hinders the dissemination of the bacilli. The time necessary for the escape of infectious material from the peritoneal cavity is thus often only a question of minutes, and it is obvious that even during an operation if the general peritoneal cavity is accidentally contaminated from the rupture of a localized abscess, etc., ample time is given before the end of the operation for the thoracic glands to become infected, and if these glands are penetrated there is a danger of the infection becoming generalized. These facts may explain the beneficial effect of Fowler's position after abdominal operations.

Journal of Tropical Medicine and Hygiene, London

July 15, XVI, No. 14, pp. 209-224

24 Clinical Study of Malarial Fever in Panama. J. P. Bates.

Annales de Médecine et Chirurgie Infantiles, Paris

July 1, XVII, No. 13, pp. 417-452

25 *Effusion in the Pericardium and its Puncture. (Les épanchements du péricarde. Etude clinique et thérapeutique. La ponction épigastrique de Marfan.) G. Blechmann.

July 15, No. 14, pp. 453-484

26 Primary and Epileptic Dementia in Children. C. Perin.
27 Meningococcus Septicemia. S. Portret.
28 *Infectious Endocarditis in Children: Three Cases. A. Blind.

25. **Effusion in the Pericardium.**—Blechmann insists that this is a more frequent occurrence in children than is generally recognized. It is not exceptional even in young infants, and fully 25 per cent. of all cases of pericarditis, he affirms, occur before the age of 5, and 50 per cent. before 15. These percentages are based on a study of 500 cases of pericarditis in the London hospitals. Effusion in the pericardium is rarely demonstrated during life but he found it in 3 per cent. of all cadavers, and there is nothing to justify the assumption that it is an agonal phenomenon as usually believed. In young infants the pericarditis with effusion is generally secondary to bronchopneumonia or empyema; between 5 and 15, acute articular rheumatism is the usual primary cause except that after 10 pneumonia may be incriminated. Between 15 and 30, rheumatism and pneumonia are encountered in the antecedents with about equal frequency, and also eruptive diseases or a bone affection. After 30, nephritis is generally responsible or cancer, and a hemorrhagic effusion is more frequent. The heart enlarges with the onset of pericarditis and dulness appears in the fifth right intercostal space (Rotch's sign). When this is accompanied by a progressively increasing symmetric area of dulness, an effusion in the pericardium is almost beyond question. Signs of abdominal and diaphragm paresis are more common in pericarditis without than with effusion. This alone may point to incipient pericarditis. The dyspnea with a large effusion in the pericardium may be relieved only by assuming the knee-chest position. Permanent distention of the jugular veins, without venous pulsation, shows that there is some obstacle in the pericardium. The "paradoxic pulse" is an important sign of pericarditis with effusion. The heart changes to a more vertical position, the apex abnormally low

The effusion collects below, back of or at the side of the heart but never in front, consequently the puncture had best be made below the xiphoid process, and if an incision is to be made it should be below the left costal arc and cartilage, so that the pericardium can be reached through the epigastrium. This technic is particularly advantageous for children; it spares the pleura, provides direct access to the pericardium and permits drainage at the lowest point. An exploratory puncture is always indicated. If a serous effusion is found of acute infectious, toxic or mechanical origin, the puncture alone is sufficient; in case of a tuberculous process puncture or pericardotomy without drainage is indicated. Purulent effusions require pericardotomy and drainage. The life of the patient may depend on early intervention, and he emphasizes that it is better for it to be too early and too extensive rather than to temporize and be too timid. Exploratory subxiphoid puncture should be the rule on the first suspicion, and this alone may cure; if not, examination of the fluid obtained at the puncture will show whether pericardotomy should follow at once or not.

28. **Endocarditis in Children.**—Blind's three cases were in children of 6 and 8, and the diagnosis was difficult as the causal acute articular rheumatism had passed unnoticed, or had not attracted the attention it deserved. The evolution of the endocarditis is very slow in such cases; the children have to be kept under supervision a long time and frequently examined by auscultation and the thermometer. The latter will reveal slight attacks of intermittent fever testifying that the endocarditis is still at work. The prognosis is difficult, as even mild endocarditis may leave irreparable valvular disease while extremely serious forms may heal without a trace. The salicylates and acetylsalicylic acid (aspirin) should be given not only during the acute phases but during the long drawn out mild evolution, and thus they may have to be kept up for a long time. Blind's three cases were all encountered in one month, suggesting an epidemic character, and all the children were free from symptoms after a few months of treatment.

Archives Générales de Chirurgie, Paris

June, VII, No. 6, pp. 641-768

29 *Abscess of the Liver. (Les abcès du foie à l'hôpital de Haiphong.) E. Sambuc.
30 *Treatment of Echinococcus Disease of the Peritoneum. (Principes du traitement chirurgical des kystes hydatiques multiples du péritoine. Indications du formolage in situ.) F. Dévé.
31 Transpleural Operations on the Lung. (La voie transpleurale. Condition de son emploi — sa valeur.) N. Lapeyre.
32 Extraction of Foreign Bodies under Radioscopic Control. P. Mauclaire.

29. **Tropical Liver Abscess.**—Sambuc calls attention to a number of points he has learned from practical experience in French China. As a rule the abscess is secondary to ameba dysentery, but alcohol and opium smoking are important factors. In 103 cases, 1893-1910, only two of the patients were women and only eleven were natives. Dysentery is less preva-

lent among the natives; their food is less harmful for the liver than the diet of Europeans, while they use less alcohol. The primary dysentery may be so mild as to escape detection or it may be mistaken for ordinary diarrhea, but dysentery is recorded as the primary cause of the liver trouble in 70 per cent. of the cases. The abscess was multiple in about 40 per cent., up to four abscesses in twelve cases and number unknown in thirteen. In twenty-two cases the abscess emptied into the air passages (7 with only 2 deaths); pleura (4); intestine (4); peritoneum (2); pericardium (1) or kidney (1), with death in fourteen of the twenty-two cases.

The front upper part of the right lobe is the most frequent seat of the suppuration, a zone corresponding to the seventh, eighth and ninth intercostal spaces. Differentiation of suppuration in the liver is often quite difficult as the liver trouble may simulate pleurisy or pulmonary tuberculosis or appendicitis or may present a syndrome suggesting malaria or typhoid. There do not seem to be any pathognomonic signs; the abscess may occur even without pain or swelling in the liver. The frequent congestion of the liver accompanying dysentery is also misleading. Abscess of the liver should be suspected whenever there is abnormally high evening temperature of uncertain origin. Puncture is harmless and generally permits differentiation of the lesion. The diagnosis of multiple foci is generally impossible except from the course of the affection. In case suppuration in the inferior aspect of the liver is suspected, an exploratory laparotomy is indicated. The abscesses close to the diaphragm are generally missed with an exploratory puncture as this is usually done too low for them. Among the post-operative complications, pleural effusion may prove fatal even when not very profuse.

He gives the details of fifteen especially interesting cases out of his total 202. In one case the liver trouble had been long erroneously treated on the diagnosis of malaria. In another an abscess in the right lobe was followed by one in the left lobe after a year's interval. In another case forty-eight punctures were made in the course of a month before the abscess was finally discovered. In another case the liver contained five liters of clear yellow pus. The absence of fever was noticeable in several of the cases. The bibliography on the subject since 1906 is appended.

30. **Treatment of Echinococcus Disease of the Peritoneum.**—Dévé uses a two-way trocar which permits aspiration of the contents of the cyst and then injection of a 5 or 10 per cent. solution of formaldehyd. If the cyst is pedunculated he cuts it out at once, but if not, and if it is very large, he applies the above technic and later opens the pocket and clears out the membranes, suturing and reducing the sac without draining. If the sac is not larger than an egg, the injection of the formaldehyd is sufficient alone. The surgeon should proceed very cautiously and not try to finish up the whole thing at one sitting.

Archives de Médecine des Enfants, Paris

July, XVI, No. 7, pp. 481-560

33 Salvarsan by the Rectum in Treatment of Children. E. Weill and Others.
34 Is Chorea the Result of a Mild, Curable Encephalitis? (Théorie organique de la chorée de Sydenham.) Deléarde, Valette and J. Comby.

Bulletin de l'Académie de Médecine, Paris

July 15, LXX, No. 27, pp. 59-118

35 Suggestions for Greater Efficiency in the Campaign against Tuberculosis. (Un programme d'ensemble pour la défense sociale contre la tuberculose.) A. Robin.

Journal d'Urologie, Paris

July, IV, No. 1, pp. 1-168

36 *Transfusion of Blood by Crile's Technic after Serious Hemorrhage from the Urinary Apparatus. F. Legueu.
37 *Renal Tuberculosis in Three Girls. J. Oraison.
38 *Importance of Examination of the *Blood* with Albuminuria. E. Roux.
39 Double [illegible] with Epispadias: Three Cases. Lebrun.
40 *Hematu[illegible] omy for Tuberculosis. M. Peña.
41 Extreme[illegible] is: Two Cases. Nicolich.

36. **Transfusion of Blood After Serious Hemorrhage from the Urinary Apparatus.**—Legueu gives minute directions for applying Crile's method of direct transfusion, and reports a case in which it was used for a patient of 69 extremely debilitated from traumatic and spontaneous hemorrhage from the bladder. The donor was the healthiest of the patient's three daughters, and the immediate effect was brilliantly successful but the patient succumbed in a few weeks to complications, among them a suppurating eschar. Legueu regards the method as destined to realize actual resurrections in many cases, and urges others to master the technic so as to be ready to apply it properly in emergencies.

37. **Renal Tuberculosis in Girls.**—Oraison knows of only forty-eight cases on record of tuberculosis of the kidney in children, and here adds three to the list. One of the children had Pott's disease, another had had a brother and sister die of tuberculosis. The symptoms were about the same as with adults except that the children all had incontinence of the bladder. One child was apparently cured by nephrectomy; the child with the spinal disease was not operated on. Catheterization of the ureters is possible in children after 6 or 7 and even easy in some; Oraison has applied it to two children of 7 and 10. It is possible, he remarks, that with renal tuberculosis in children medical treatment might be given a little longer trial than in adults, in the very incipient cases. In one of his cases the mother was affronted with his diagnosis of tuberculosis of the kidney in her apparently healthy little daughter, although he found the right kidney large and tender and the terminal urine contained a tinge of blood. A year later nephrectomy became indispensable and the kidney was found studded with cavities. The child still has symptoms on the part of the bladder. The first sign of trouble in this case had been frequent micturition with extremely limpid urine; he regards this "limpid pollakiuria" as an important sign of incipient renal tuberculosis at any age.

38. **Examination of the Blood with Albuminuria.**—Roux declares that examination of the blood is indispensable along with other diagnostic measures in kidney disease. It is even more important than the rest, he insists, in many cases in which the main source of the albuminuria is not in the kidneys but is the result of disturbance in the blood, a dyscrasia of the blood. This may be both a cause and an effect, and it should receive adequate attention in treatment. The system must be toned up without intoxicating it, supplying the needed minerals for renovation of the morbid blood corpuscles. Roux practices at the Saint-Nectaire mineral springs, and has had more than 1,000 albuminuric patients taking the waters, and has found in this discovery of the dyscrasia of the blood the explanation of the remarkable benefit from the waters in certain cases. The blood corpuscles may be remarkably resistant, even more so than normal. These are the cases with abnormally high blood-pressure and signs of fibrous degeneration of the kidneys. The unusually high resisting power of the corpuscles seems to be a defensive reaction on the part of the organism, constantly required by the impaired eliminating power of the kidneys. When this extremely pronounced resisting power of the corpuscles is accompanied by persisting and pronounced retention of nitrogen and chlorids or high albuminuria, the prognosis is very grave. The patients are already in progressive toxemia. On the other hand, when the leukocytes display a much reduced resisting power, and the general health keeps good, the kidneys do not seem to be so seriously affected as in the first group, and the prognosis depends mostly on whether the blood can be brought back to normal. Each exacerbation of the kidney trouble is a new menace, but a clinical cure is still possible although there may be persisting slight residual albuminuria as the glomeruli are left unduly porous. It is easier to act on the blood than on the kidneys, he adds, and the tonic and rejuvenating action of mineral waters in these cases is readily explained by their action on the blood, while it is impossible to explain it if we ascribe the albuminuria solely to the changes in the kidney.

He gives the technic with which he determines the resistance or fragility of the leukocytes, mixing first 1 drop of blood with 30 drops of a mixture of 1.5 gm. sodium chlorid, and 1.2 gm. sodium citrate in 300 c.c. of distilled water. After twenty minutes, 2 drops of formaldehyd diluted with its own volume of distilled water are added; the whole is centrifuged, the deposit still moist is spread on a slide by capillary attraction from the pipet; fixed with alcohol-ether, and stained with hematein for ten minutes and eosin-orange for twenty seconds. The resisting leukocytes are round, the nuclei distinct and separate, while the leukocytes that are below par have irregular outlines, the nuclei look blurred and blend more or less together, and they take the stain poorly

40. **Renal Hematuria after Nephrectomy.**—Peña summarizes twenty-two cases of hematuria coming on soon after removal of the other kidney for tuberculosis. It may be the sign of a tuberculous process in the remaining kidney, too slight to have been detected by the diagnostic measures applied, or it may be the work of some ordinary infection or a manifestation of hematuric nephritis. In any event, the prognosis should always be guarded as the course in his cases of this kind demonstrated that the hematuria could not be ascribed to a mere reaction congestion.

Revue de Chirurgie, Paris

July, XXXIII, No. 7, pp. 1-172

42 Transplantation of a Portion of the Tibia to the Spine for Pott's Disease. F. V. Albee (New York).
43 *Fracture of Petrous Bone. (Sur le traitement des fractures du rocher.) H. and A. Nimier.
44 *Metastatic Abscess in the Brain. (Abcès métastatiques de l'encéphale en rapport avec les suppurations hépato-pulmonaires.) Couteaud.
45 *Mercuric Chlorid as a Surgical Disinfectant. (Le sublimé en chirurgie.) E. Marquis.
46 Danger from Ligation of Internal Jugular Vein and Resection of the Pneumogastric. (La résection unilatérale de la jugulaire interne et du pneumogastrique est-elle inoffensive?) P. Guibal.

43. **Fracture of the Petrous Bone.**—Nimier advocates the transmastoid route for access to an extradural hematoma complicating fracture of the petrous bone. If the hematoma is intradural and it cannot be removed by repeated lumbar puncture, the best mode of access is through the temporal bone above the mastoid. This opening can be made first or as an extension of the transmastoid operation. In case of infection, repeated lumbar puncture and decompressive trephining aid in protecting against involvement of the brain, especially when an accompanying or pre-existing otitis has been treated properly, without wasting time on alleged "meningism." Some cases are reported in detail to show the danger from neglect to make a thorough examination when the operation is once decided on. One patient with old bilateral otitis was kicked in the head by a horse, and two operations six months and eight months later seemed to relieve the otitis, which had flared up after the accident, but the patient died and necropsy revealed an abscess in the cerebellum which could easily have been evacuated if the meninges had been incised at the operation.

44. **Metastatic Abscess in the Brain with Liver and Lung Abscess.**—Couteaud reports a case from his own practice and summarizes several other unpublished and published cases, bringing the total to fifteen. The left side and the frontal lobe were most frequently involved. In two cases the brain abscess was secondary to fetid bronchiectasia. To date these metastatic abscesses have invariably proved fatal. In case of ameba dysenteric abscess it is possible that administration of emetin might transform conditions in the primary focus so that evacuation of the metastatic abscess might have a chance for success.

45. **Mercuric Chlorid in Surgery.**—Marquis ascribes to Koch the reputation enjoyed by mercuric chlorid as the "sublime antiseptic." He reviews its history and reports experimental and clinical research, the results of which, he says, have pricked the bubble of its reputation and shown it to be the least penetrating of the surgical disinfectants in vogue and, in spite of its great antiseptic power, to be the least bactericidal of all.

Revue Médicale de la Suisse Romande, Geneva

July, XXXIII, No. 7, pp. 513-576

47 *Mistakes in the Diagnosis of Appendicitis. F. de Quervain.
48 Hemorrhagic Myeloid Leukemia. H. Ter-Barseguian. To be continued.
49 Gas Embolism during Procedure for Artificial Pneumothorax; Recovery. *Sillig.*

47. **Mistakes in Diagnosis of Appendicitis.**—De Quervain has been examining the records of the different Swiss hospitals during the last five years and has found nearly a hundred cases in which an operation was done on the erroneous diagnosis of appendicitis. In considerably more than half the cases the trouble was some acute surgical abdominal affection which required a laparotomy, so that no harm was done by the operation, but in about twenty cases no operation was actually needed. In seven cases the trouble was really pneumonia; as it commenced with abdominal symptoms it was mistaken for appendicitis. He warns that children are liable to vomit on the slightest excuse, without necessarily having anything the matter with stomach or bowels and they are liable to run up a fever even more readily. Children are also inclined to locate at the umbilicus anything wrong within. The problem is rendered still more difficult by the cases of pneumococcus peritonitis, especially in girls, and liable to follow pneumonia. With older children and adults, the decision to operate is made more readily than for children under 5, while appendicitis is relatively rare under this age. In three cases typhoid fever was mistaken for appendicitis; this is particularly liable to occur when the patient and family give misleading accounts of the antecedents. Whenever the general depression and headache cast doubt on the diagnosis of appendicitis, it is wise to examine the blood for typhoid or paratyphoid bacilli and put away the bistoury. In seven neuropathic cases the patients simulated the symptoms of appendicitis and were needlessly operated on.

He repeats the warning of the English surgeon to be wary in accepting the diagnosis of appendicitis in women when the hymen is not intact. Minor accessory details may suggest the true cause of the disturbances in a spontaneous or criminal abortion: vagueness as to the date of the last menses, and the worried expression of the patient and her fiancé; slight pressure on the breast may cause exudation which clears up the diagnosis at once. In one case a young woman appeared with the diagnosis of appendicitis the day after a ball; her temperature was over 104 F. and face congested. Examination disclosed a staphylococcus peritonitis from recent rupture of a right pyosalpinx. With rupture of a pregnant tube a movable area of dulness develops almost at once, and an effusion can be palpated in the pouch of Douglas, while the tint of the ears, lips and nails shows the anemia. Add to this vagueness as to the last menstruation, and the assumption of appendicitis can be dropped. In conclusion de Quervain says that knowing the dangers of temporizing with true appendicitis, that surgeon is the bravest who does not fear occasionally to run the risk of a false diagnosis.

Semaine Médicale, Paris

July 23, XXXIII, No. 30, pp. 349-360

50 Operative Treatment of Posterior Parametritis and Other Old Infiltrations in the Small Pelvis. W. Falgowski.

Berliner klinische Wochenschrift

July 14, L, No. 28, pp. 1285-1332

51 *Gastric and Duodenal Ulcer; 369 Operative Cases. (Diagnose und chirurgische Behandlung des Magen- und Duodenalgeschwürs.) J. Sherren.
52 *Vomiting of Pregnancy. (Das Erbrechen der Schwangeren.) R. Asch.
53 *Nature of Exophthalmic Goiter. (Theoretischer und experimenteller Beitrag zu einer neuen Theorie der Basedow'schen Krankheit.) J. Marimon.
54 Action of Roentgen Rays on the Agglutinins. E. Fränkel and K. Schillig.
55 Personal Experiences with Friedmann's Remedy; Eighteen Cases; No Improvement. (Persönliche Erfahrungen mit der Friedmann'schen Behandlung der Tuberkulose.) G. Mannheimer (New York).
56 [illegible]. P. Lazarus.
57 [illegible]. H. Reiner.
58 [illegible] Pulsus durus.) B. Lewinsohn.

51. **Gastric and Duodenal Ulcer.**—Sherren has operated for duodenal ulcer in 190 cases and for gastric ulcer in 179, and reviews this material from the standpoint of diagnosis and indications. Remissions in the pains are peculiarly characteristic of chronic gastric or duodenal ulcer. Days or weeks of the attacks of pain coming on regularly at a certain hour after meals may alternate with long periods of apparently normal digestive conditions. There is nothing pathognomonic of hour-glass stomach except possibly the persistence of the symptoms; after years of intermittent dyspepsia, the disturbances gradually become practically continuous. There was no free acid in seven of his nineteen cases of hour-glass stomach and the acidity was subnormal in eleven of the thirteen tested. Only four of the nineteen were men. In only 123 of his 160 cases of chronic duodenal ulcer were the symptoms characteristic; the others suggested gall-stone

trouble or gastric ulcer. Hunger pain was present in all but twenty of 146 cases; in the intervals the patients felt entirely well. Anger, chilling and overwork are liable to bring on an attack. In one group there was absolutely no pain at any time; the symptoms consisted merely of attacks of dilatation of the stomach with vomiting, alternating with intervals of complete health. There was excess of free acid and the total acidity was high; the opposite is the rule in cases with similar symptoms due to gall-stone or coprostasis.

Before any operation on the stomach for a chronic condition he has the mouth carefully supervised and decayed teeth treated; beginning twenty-four hours beforehand only sterilized food is allowed. Afterward the patient is allowed to drink freely. Vomiting is unusual. He impresses on the patient the necessity for care in the diet for three months, avoiding roast beef, ham and bacon, and taking between meals a teaspoonful of a powder containing equal parts of sodium bicarbonate, magnesium carbonate and bismuth oxycarbonate. Hematemesis was the first symptom of trouble in 75 per cent. of the young women patients but it seldom proved fatal. He never operates for this alone, but when there is bleeding from a chronic gastric or duodenal ulcer, this calls for operative measures without delay. He declares that the danger from this tardy and grave complication of a chronic ulcer is not appreciated as it deserves. The hemorrhage may be fulminating; as a rule it stops spontaneously but returns later and proves fatal. The operation should be done as soon as the condition permits, not later than thirty-six or forty-eight hours, keeping the stomach absolutely quiet in the interim.

52. **Vomiting of Pregnancy.**—Asch thinks that the vomiting of pregnancy is readily explainable by various factors which cooperate in its production and which are generally under our control, so that it is possible to ward off serious trouble from this cause. The nausea experienced by some persons in swinging or riding in a merry-go-round is a reflex phenomenon, not a neurosis, and the vomiting of pregnancy is a similar reflex phenomenon. The existence of the pregnancy, the germinating ovum, has a tendency to upset the training of civilization and bring back a reversion to primitive reflexes. Another factor at work is the dread of the burden of responsibility a child brings with it; the pregnancy may be unwelcome, and these psychic factors depress the appetite and upset the digestion. When vomiting has once occurred, it occurs afterward more readily, as a memory process.

Another factor in the loss of appetite, he explains as *Ueberhungertsein*, that is, the loss of appetite which follows when one is overfatigued or does not eat when hungry. After a certain period the sensation of hunger subsides. The pregnant woman needs nourishment for two, but if her hunger is not satisfied at the proper time, she loses her appetite; if then she eats from duty or custom, without appetite, she is liable to neglect proper mastication and the stomach does not do its work properly in turn. As the pregnant woman needs more nourishment than under other conditions, the ordinary intervals between meals are too long for her, and by the time the meal arrives she has lost her appetite owing to the *Ueberhungertsein*. Added to all this is the fact that in our civilization the natural instincts are deadened, the reflexes sluggish in comparison to primitive peoples. Tobacco, for example, usually induces nausea when used for the first time, but not after one has become used to it. A pregnant woman, however, is liable to feel nausea at the smell of tobacco when at other times she may even, herself, enjoy smoking.

The pregnant woman does not realize that she needs more nourishment; her reflexes are deadened by the customs of civilized life, but she should eat oftener than at other times, and experience has shown that she tolerates better meals of either fluid or solid food, not the two combined. Asch therefore orders her to eat at intervals of two and a half hours, alternating fluids and solid food, not drinking at meals with the latter, but drinking copiously at other times. Before going to bed and if she is wakeful at night he orders something light, not requiring much chewing as this is liable to induce wakefulness. If there is nausea when she sits up first in bed in the morning—which he ascribes to anemia of the brain, as in seasickness—he has her take through a tube or otherwise, while still reclining, a glass of milk or cup of coffee, chocolate, tea or soup and lie still for fifteen or twenty minutes afterward. If there is a distaste for anything of the kind, a glass of hot Vichy or other water might inaugurate the custom. In some cases the vomiting comes on for the first time in the morning as the teeth are brushed; in these cases treatment of the accompanying catarrh of the throat will generally put an end to all trouble. The meals can be eaten reclining, and reclining after meals is useful, as also application of heat, a thermophor. In one almost desperate case he tided the patient past the danger period by feeding exclusively with frozen hard milk, coffee, apple sauce, ice cream, etc., all frozen hard.

Great evil is often done by the accounts of the experiences of friends and the advice of relatives, keeping up the memory of vomiting and bringing back the nausea. There is still another group of cases in which the vomiting is a reflex from contracture of the cervix. Dilatation of the os is often followed by relief from all symptoms and the pregnancy persists undisturbed. If this and all else fails, the dilatation can be repeated and Nature left to evacuate the uterus.

53. **Theory of Exophthalmic Goiter.**—Marimon presents arguments to sustain the view that myxedema and exophthalmic goiter are due to the same cause, insufficient thyroid functioning. The former is the result of defective utilization of the iodin assimilated from the food and metabolized in the liver or elsewhere. Exophthalmic goiter, on the other hand, is the result of injury from iodin getting into the blood insufficiently metabolized. This assumption explains the coincidence of myxedema and exophthalmic goiter, which he has frequently observed and which it is impossible to explain by the current theory that myxedema is the result of hypothyroidism and Basedow of hyperfunctioning. As he remarks, a glass cannot be full and empty at the same time.

Correspondenz-Blatt für Schweizer Aerzte, Basel

July 12, XLIII, No. 28, pp. 865-896

59 Technic for Diagnostic Inoculation of Animals. (Die Anwendung der intrakutanen Tuberkulinreaktion als Hilfsmittel [illegible] Nachweise von Tuberkelbazillen im [illegible] Schürmann.
60 In[illegible] and Race on the Genital Sphere of Women. (Einfluss des Klimas und der Rasse auf das weibliche Geschlechtsleben.) M. Steiger.

Deutsche medizinische Wochenschrift, Berlin

July 10, XXXIX, No. 28, pp. 1345-1392

61 Migrating Cells in the Cornea. (Wanderzellenbildung in der Hornhaut.) P. Grawitz.
62 *Etiology of the Acute Psychoses. L. W. Weber.
63 Salvarsan in Progressive Paralysis. Raecke.
64 Intravenous Injection of Camphor. W. Weintraud.
65 Copper and Gold Salts in Tuberculosis. (Chemotherapeutische Versuche bei Lungentuberkulose.) S. Pekanovich.
66 Liver Disturbances in Experimental Trypanosomiasis. (Ueber Lävulosurie sowie neuartige Serum- und Leberstoffe bei Trypanosomiasis.) K. Schern and H. Citron.
67 *The Hemorenal Index as Test of Kidney Functioning. [illegible] des hämorenalen Index als Prüfung der Nieren-[illegible]
68 *[illegible] W. Krebs.
69 Special Care Necessary in Management of Delivery with Hypoplasia of Vascular System. (Die geburtshilfliche Bedeutung des Status hypoplasticus.) E. Vogt.
70 Foreign Bodies in the Esophagus. (Zur Bewertung der Methoden der Extraktion von Fremdkörpern aus der Speiseröhre.) A. Wagner.
71 *The Children of the Tuberculous. W. Weinberg.
72 Fecundation During Alcohol Intoxication. (Die Zeugung im Rausche.) P. Nacke.
73 Diathermia in Treatment of Deafness from Middle-Ear Disease. (Behandlung der Schwerhörigkeit nach Mittelohrerkrankungen mittels Diathermie. [illegible]) Hamm.

62. **Acute Mental Disease.**—Weber refers in particular to the psychoses which have a sudden onset and fulminating course with fatal outcome, and describes several cases of this type. In one, a young man of 27, free from syphilis and drinking habits, had several attacks of influenza and as the last attack subsided developed an acute and fatal psychosis. Necropsy in this as in the other cases revealed a combination of several morbid processes none of which alone could explain the acute psychosis, but their superposed action on an old chronic cerebral affection was responsible for the acute mental disease. The cerebral affection although chronic had evidently been so mild that it had caused no functional dis-

turbances, notwithstanding its diffuse character. Only when some acute injury was superposed, as from a trauma, intoxication, infection, or affection of other organs, especially of the cardiovascular system, did the brain break down. The chronic cerebral affection found in the above cases was a diffuse chronic fibrous leptomeningitis or diffuse arteriosclerosis of the cerebral vessels. The latter may be disclosed only by the microscope. The leptomeningitis may date from some infectious disease in childhood; it is possible that a similar combination of several injurious factors may be responsible for other forms of mental disease.

67. **The Hemorenal Index as Test of Kidney Functioning.**—Bromberg gives an illustrated description of his apparatus to determine the relative electric conductibility of the blood and urine as a means of demonstrating their content in inorganic salts. In health the ratio of concentration in the urine and blood is as 2 to 1. If the ratio is 1.5 or less with bladder urine, both kidneys are probably diseased; if the urine from the ureter catheter on the sound side shows a ratio of 2 or even 1.8, the diseased kidney can be removed without hesitation. The amount of resistance offered by the fluid under examination to the electric current is the principle on which the test is based; only 0.5 c.c. of urine and 0.5 c.c. of blood serum are needed for the comparative test. He says that the instrument described enables the test to be applied in the easiest and simplest manner and that the findings are more reliable than with any other technic.

68. **Syphilis and Neurasthenia.**—Krebs is convinced that the causal agent of syphilis is responsible not only for the tardy anatomic injury of the central nervous system manifested in paralysis and tabes, but that it is also directly responsible for the neurasthenia which he found marked in 43 per cent. of his 114 syphilitic patients with neurasthenia or other functional nervous affection. On the other hand, only 18 per cent. of 1,000 patients in other categories had symptoms of neurasthenia. The practical conclusion follows that the Wassermann test should be applied to all neurasthenic patients when there can be the slightest suspicion of syphilis; in case of a negative response, he advises to test the cerebrospinal fluid. If the reaction is positive, antisyphilitic treatment should be instituted in combination with general tonic measures and measures addressed to the nervous system. He thinks that syphilitics should take a regular four-weeks' course of treatment every year even when they are free from symptoms, and more when symptoms develop. Repetition of the Wassermann test is not so imperative.

71. **The Children of the Tuberculous.**—Weinberg has records of 5,000 families with one or more tuberculous members and a total of 18.000 children whose history is known until their twentieth year. This material is analyzed from various standpoints; it confirms the special danger of contact infection.

Deutsche Zeitschrift für Chirurgie, Leipsic

CXXII, Nos. 3-4, pp. 171-358

74 Ultimate Outcome of Radical Operative Treatment of Tuberculous Knees in Adults. W. May.
75 Retrograde Incarceration with Hernia. (Retrograde Darmeinklemmung bei Brüchen.) v. Wistinghausen.
76 Decompressive Craniotomy with Primary Plastics by Twisting the Bone Flap Slightly Askew. U. Stoppato.
77 Tumors in Tendon Sheaths. (Die bisher als Riesenzellensarkome bezeichneten Granulationsgeschwülste der Sehnenscheiden.) J. Fleissig.
78 Radical Operation for Hernia with Incomplete Hernial Sac. (Darmgleitbrüche.) M. Schmidt.
79 Atrophy of the Prostate Induced Experimentally by Roentgen-Ray Exposures. J. Sasaki.
80 Hemorrhage from Isolated Tear in Phrenic Artery. A. Reinhardt.
81 Cure of Ischemic Contracture by Transplantation of Muscle. R. Göbell.
82 Drain Tube for Artificial Common Bile Duct. F. Cahen.
83 Case of Primary Tuberculosis of the Gums. H. v. Tappeiner.

Medizinische Klinik, Berlin

July 13, IX, No. 28, pp. 1105-1148

84 *Treatment of Retroflexion of the Uterus. O. v. Franqué.
85 *Acute Infections in Infants. E. Müller.
86 *Hitherto Overlooked Factors in Nutrition. (Einige bisher in der Physiologie und Pathologie der Ernährung noch nicht berücksichtigte Faktoren.) H. Schaumann.
87 The Respiration as Aid in the Circulation. (Bedeutung der Atmung als Auxiliarkraft des grossen Kreislaufs.) L. Hofbauer.
88 *Arteriosclerosis before Thirty. M. Hirsch.
89 *Color Test for Albumin. (Eine Farbenreaktion auf Eiweisskörper.) L. Lewin.
90 Pulmonary Tuberculosis and Northern Seashore. (Lungentuberkulose und Nordseeklima.) Ide.
91 Hemolytic Jaundice. (Gibt es einen echten hämatogenen Ikterus?) J. W. McNee.

84. **Retroflexion of the Uterus.**—Franqué insists that retroflexion does not need correction unless it is causing symptoms, as a rule; indiscriminate treatment in every case, even in virgins, may do great harm. The wearing of a pessary is liable to bring on catarrhal conditions and often entails posterior parametritis and pelveoperitonitis. He knows of one physician who systematically corrects retroflexion by vaginofixation or ventrofixation; he could write a book on the later disturbances in childbed resulting from his hundreds of such operations. Many of the patients afterward came into Franqué's service, still complaining of their old trouble or with new ones superposed. Even the Alexander-Adams operation does not always correct the trouble and, if it does, does not always cure the disturbances because the retroflexion was not responsible for them in the first place. Examination of women long after treatment for retroflexion shows that they are rarely cured of their old troubles, while systematic abstention from any treatment in a series of cases will show that the women do equally well without any local measures. The exceptional cases in which treatment is justified are the rare instances of traumatic dislocation of the uterus with an inflammatory reaction. Here the uterus must be restored to normal place on account of the danger of its becoming bound down by adhesions.

Franqué emphasizes that the normal retroflexed uterus is unable to exert pressure on the rectum or the sciatic plexus as it is too small; trouble is liable only when there is inflammation or when the uterus is enlarged from chronic metritis, tumors or pregnancy. Even the pregnant uterus presses only on the bladder and urethra, as a rule; if the retroflexion of the gravid uterus is discovered before serious symptoms have resulted, it is sufficient to straighten it and, up to the fourth month, introduce a pessary, if this can be done with ease. If not, the uterus may gravitate into normal place if the woman assumes the knee-elbow position or the lateral-abdominal position with the pelvis raised. If this fails, the elastic pressure of a colpeurynter in the vagina will generally answer the purpose. Of course acute symptoms on the part of the bladder call for more active measures, emptying the bladder, straightening the uterus and introducing a pessary, under general anesthesia at need. Retroflexion discovered during the puerperium should also always be corrected and can generally be cured by wearing a pessary for six months to a year. The displacement in these cases may first reveal itself by hemorrhage in the second up to the sixth week after delivery. These hemorrhages stop at once when the uterus is straightened, and ergot and hot vaginal douches are given. Other conditions generally demanding treatment are when with the retroflexion there is prolapse, sterility or habitual abortion. Nervous dyspepsia and gastric symptoms in general he does not regard as indications alone for correction of retroflexion. It is best not to call the patient's attention to her retroflexion. Dysmenorrhea likewise is scarcely ever the direct consequence of uncomplicated retroflexion.

85. **Acute Infections in Infants.**—Müller remarks that the lime-light of attention has shifted in the last few years from the difficulties of infant feeding to the dangers of acute infections for infants. Many of the old febrile "digestive disturbances" are now known to be the work of infection. Some of the known air-borne infections manifest themselves mostly by intestinal symptoms. The purely intestinal affections of infants have constantly lost ground, while among the parenteral, infection by way of the air is becoming more and more important as infection by contact grows less frequent.

The complex of infections which we call influenza is particularly noxious for infants; the influenza may manifest itself with a catarrhal fever and inflammation in the air passages; or it may induce predominantly intestinal symptoms, or the syndrome may be merely an intermittent fever without other symptoms but suggesting a septic course, probably due to general toxemia. Influenza is air-borne, as a rule, and partitions a little over six feet high seem ample protection. Glass "boxes" of this kind to isolate the infants have answered the purpose of protecting against all these air-borne infections except chicken-pox; the germ of this seems to be so light that it does not settle down in the quiet air of the "box" but floats off over the partitions. Meyer has recently reported that children suffering from recurring influenza suddenly began to thrive when they were placed in "boxes."

Another evil of influenza is its frequent connection with diphtheria. In his service, throat diphtheria is very rare in infants but numbers of the little ones are carriers of diphtheria bacilli. In many instances, the "coryza of infants" is really a combination of influenza and diphtheria; the nasal secretion is usually bloody-purulent in these cases. The gravity of such a combination is obvious, and the necessity for bacteriologic examination and antitoxin treatment. The latter seldom cures but at least it prevents the spread of the diphtheria to the throat. Infants seem particularly susceptible to whooping-cough, and the course and effects are exceptionally serious in them, especially in the rachitic. The exudative diathesis predisposes to pertussis, but in his experience the manifestations did not seem to be more severe in the children inclined to spasmophilia than in others. In all cases of acute infection in an infant, the first and main points are to protect it against new infections, to isolate it and to keep it in a sunny room: the sunlight is a particularly powerful disinfectant in respect to influenza.

In conclusion he calls attention to the variation in the character of epidemic infections at different times, and reiterates anew the importance of paying less attention to the intestines of infants and more to their general infections.

86. **Recently Discovered Factors in the Physiology and Pathology of Dietaries.**—Schaumann was one of the pioneers in the research on dietary antineuritic factors, and he here reviews his own and others' work in this line to date. (The Journal has editorially reviewed the outcome from time to time as, for instance, in the issue for May 17, 1913, page 1543.) Schaumann thinks it is a significant fact that the proportion of phosphorus in the brains of pigeons with polyneuritis was found abnormally small. His continued research has confirmed the relatively minute proportion of these antineuritic substances in the food; also that they are present in most articles of diet but are readily removed or destroyed. Rice and other cereals lose them by polishing, and they are destroyed in other articles of food by heating above a certain point or long cooking, by desiccation and by pickling, by boiling in excessively alkaline water, by mouldiness, and possibly by the action of the intestinal flora. The disturbances which result from lack of this protecting substance or substances take different forms in different living beings: A herbivorous mammal develops scorbutus, an omnivorous mammal a mixture of scorbutus and neuritis, while goats, monkeys, fowls and pigeons develop multiple neuritis.

The practical conclusions from all the research reported are that the dietary of man must comprise not only the familiar carbohydrates or fat, protein, mineral elements and water but it must include minute amounts of these still unisolated substances which are of vital importance. It must further contain albumin with a certain amino-acid content, especially tryptophan and tyrosin. The lack of one or more of these still unisolated substances is liable to entail certain single or combined metabolic disturbances. All this throws light on the diseases of deranged metabolism in which he includes rachitis, pellagra, beriberi and scorbutus.

88. **Arteriosclerosis Before Thirty.**—Hofbauer thinks that the reports of cases of arteriosclerosis in children must be regarded with considerable doubt. Those reported between 20 and 30 are more worthy of credence, and he is convinced that many cases labeled neurasthenia were in reality cases of arteriosclerosis in adults under 30. The unfavorable prognosis generally associated with arteriosclerosis is due to the fact that it is not diagnosed until irreparable lesions are already installed; if we watch for its incipient manifestations earlier in life, there is no doubt that we can cure or at least keep it under control.

89. **Color Test for Albuminoids.**—Lewin calls attention to the delicacy and reliability of the color reaction which follows when dissolved albumin is treated with a mixture of 0.1 to 0.15 parts trioximinomethylen in 100 parts crude sulphuric acid. Even a 0.02 per cent. solution of egg albumin shows the characteristic violet tint.

Münchener medizinische Wochenschrift

July 15, LX, No. 28, pp. 1529-1584

92 *Photodynamic Action of Mineral Pitch. (Photodynamische Wirkungen von Inhaltsstoffen des Steinkohlenteerpechs am Menschen.) L. Lewin.
93 *The Biologic Test for Pregnancy. (Ueber künstlich herbeigeführte und natürlich vorkommende Bedingungen zur Erzeugung der Abderhaldenschen Reaktion und Ihre Deutung.) E. Heilner and T. Petri. (Studien über die Spezifität der Abwehrfermente.) A. E. Lampé and L. *Papazolu.* *(Natur des bei der Abderhaldenschen Reaktion* wirksamen Fermentes.) Z. Steising.
94 Interchange of Nutrients between Rats in Parabiosis. P. Morpurgo and G. Satta.
95 Intradermal Reaction in Syphilis and Frambesia. G. Baermann and H. Heinemann.
96 Rise in Temperature in Rectum. A. Weinert.
97 Extension for Fracture of Upper Arm. T. Christen.

92. **Photodynamic Action of Mineral Pitch.**—Lewin had his attention called to an itching and *smarting affection* which developed on the exposed portions of the skin in 103 persons engaged in an establishment making electric appliances. Those affected had to handle coal tar pitch, and the itching occurrred only while the parts were exposed to the light. Only 15 of the total 103 complained of itching in the dark. The substance was known to have fluorescent properties; the photodynamic properties of fluorescent substances have recently been emphasized by several scientists. This is the first instance known, however, of a photodynamic action from coal tar. A mild ointment or washing with diluted sapo medicatus soon reduced the itching; washing otherwise had a tendency to exaggerate the itching.

93. **The Biologic Tests of Pregnancy, Etc.**—Laboratory workers everywhere are now hard at work on Abderhalden's "protective-ferment" tests for pregnancy, cancer, etc. Heilner and Petri conclude from the results of their research that positive findings are merely the result of the getting into the blood of some of the individual's own albumin which has retained its chemical individuality. It is immaterial how this albumin gets into the blood; it may be from a hematoma from any source, a crushing injury, inanition, fever, infectious disease, cancer, cachexia—any of these is liable to entail the passage of some unmodified albumin into the blood and the consequent positive reaction. There is nothing specific about it, they state, beyond this.

Lampé and Papazolu applied the test to twenty-five patients with exophthalmic goiter and three with simple goiter, and to a few patients with nephritis or diabetes. The findings indicate that the thyroid secretion, the thymus secretion and also the ovarian secretion are perverted in exophthalmic goiter.

Steising announces that he has succeeded in separating the active ferment into an amboceptor and a complement part; this permits the use of old serums for the test, and renders the technic much more generally applicable. He inactivates the serum by heating to 58 C. for an hour and then reactivates it as desired by addition of fresh male serum. (See Editorial in The Journal, Aug. 16, p. 493.)

Wiener klinische Wochenschrift

July 17, XXVI, No. 29, pp. 1193-1232

98 Case in which Atropin Had the Reverse of Its Usual Effect. (Ueber inverse Atropinwirkung.) R. Kaufmann and H. Donath.
99 *Radium Treatment [illegible] Tumors. A. Exner.
100 Multiple Primary [illegible] A. Krokiewicz.
101 Mechanism of Sta[illegible] (Zur Physikochemie der Zellfärbung.) P. v. Szily.
102 No Influence from Salvarsan in Case of Rabies. (Erfolglose Anwendung von Salvarsan bei Lyssa.) L. v. Zumbusch.
103 Congenital, Unilateral Paralysis of Cervical Sympathetic. E. Pollak.
104 Fatal Sepsis after Extraction of Tooth. (Die Kiefertrepanation bei dentalem Markabszess.) B. Mayrhofer.
105 Heliotherapy in Surgical Tuberculosis. M. Jerusalem.

99. **Radium Treatment of Cancer.**—Exner has found it possible to enlarge the passage with cancer of the esophagus by treatment with radium, and has thus treated twenty patients. In two cases the cancer perforated into the trachea or mediastinum, and it is possible that this might not have occurred, at least quite so soon, without the radiotherapy. His experience with radium as also with roentgenotherapy has apparently demonstrated that weak dosage, inadequate exposures, have a stimulating influence on the growth of the cancer. In a few instances severe hemorrhage has followed the exposures. He has applied the radium treatment in forty cases of cancer elsewhere and reported in 1910 a permanent cure since 1904 and 1905 in two cases of almost inoperable carcinoma of the buccal mucosa and jaws or upper lip. These are the only ones of the forty patients with deeply rooted cancer who have remained free from recurrence for more than three years after the exposures and both of these have died recently of recurrence, fatal in a few weeks in the first case, after nine years of health. The other patient had a recurrence after seven years but this was apparently subsiding under renewed radium treatment when the woman died of acute phthisis. Of the rest of his material he was able to keep twenty patients in comparatively good health for three or four years and a few for five or seven, when they were evidently otherwise doomed to die of their malignant disease in a few months. Exposure to adequate doses of the therapeutic rays causes an intense proliferation of connective tissue around the growth, thus walling it in, as it were, and preventing the spread to the lymph-nodes in the vicinity. In cases of cancer of the tongue and pharynx in which, under other conditions, the connected lymph-nodes become rapidly involved, they were not invaded. This absence of metastasis apparently confirms the assumption that the efferent lymphatics become impermeable under the influence of the radiotherapy.

Zeitschrift für Geburtshülfe und Gynäkologie, Stuttgart

LXXIII, No. 2, pp. 335-630. Otto Küstner Festschrift. Last indexed August 2, p. 376

106 Obstetrics and Prevention of Infant Mortality. (Geburtshilfe und Säuglingsfürsorge.) A. Kellmann.
107 Changes in the Liver during Pregnancy. (Leberveränderungen in der Schwangerschaft.) E. Opitz.
108 Connection between Inflammation of the Large Intestine and the Female Genital Organs and Functional Neuroses. E. Opitz.
109 The Metreurynter with Myoma Complicating Delivery. (Hystereuryse bei Myom unter der Geburt.) A. Christiani.
110 The Question of Sterilizing Tuberculous Women. (Tuberkulose und Gravidität.) G. Stütz.
111 *Operative Treatment of Peritoneal and Genital Tuberculosis. O. Schmidt.
112 *Experiences with Eclampsia; Ninety-eight Cases. O. Schmidt.
113 Cystic Kidneys and Pregnancy. F. Hensius.
114 Cystoscopic Diagnosis of Ureter Stone and its Extraction by Way of the Vagina. F. Heinsius.
115 Induced Premature Delivery in Management of Moderately Contracted Pelvis. (Erfolge der künstlichen Frühgeburt beim engen Becken mittleren Grades.) W. Ponfick.
116 Tumor on the Buttocks (Steisstumor.) A. Heyn.
117 Vaginismus is merely a Psychic Reflex or Phobia. (Ist beim Vaginismus eine blutige Erweiterung notwendig?) H. Rothe.
118 Extraction of Fetus with Breech Hook. (Zur Extraktion mit Küstners Steisshaken.) A. Strempel.
119 *Prophylactic Treatment of Eclampsia in Wage-Earners' Homes. (Eklampsiebehandlung nach Stroganoff in der Arbeiterwohnung.) A. Strempel.
120 Postoperative Ileus. G. Schubert.
121 *Importance of Gonorrhea in the Modern Management of the Puerperium. (Bedeutung der Gonorrhhoe für die moderne Wochenbettsdiätetik.) W. Hannes.
122 Internal Secretion of the Ovaries and its Relation to the Lymphocytes. F. Heimann.
123 Intra-Uterine Amputation of the Thigh with Closure of Urethra and Rectum. H. Küster.
124 Importance for Delivery and Puerperium of Early Rupture of Fetal Membranes. (Bedeutung des frühzeitigen Blasensprunges für Geburt und Wochenbett.) R. Basset.
125 Bacteriologic Examination with Extraperitoneal Cesarean Section. O. Bondy.
126 Vaginal Germs and Endogenous Infection. O. Bondy.
127 *Experiences with Eclampsia; 158 Cases. W. Rohrbach.

111. **Operative Treatment of Peritoneal and Genital Tuberculosis.**—Schmidt tabulates the details of thirty-eight operative cases. Two of the patients were moribund and ten others have died since, but twenty-three were restored to health by the operation. Four of the patients were between 15 and 20; twenty-one between 20 and 30, and the oldest patient was over 70. Nineteen are living of the twenty-four patients not given drainage, and four of the thirteen with drainage. One patient with a tuberculous process in the uterine mucosa recovered after curetting alone; another after abdominal hysterectomy; another with a secondary peritonitis but no ascites recovered after curetting and a laparotomy, as also another with effusion, given a supplementary posterior colpotomy. A patient with a tuberculous process in both uterus and tube recovered after panhysterectomy. The laparotomy also cured another patient with a tuberculous tube and peritonitis with effusion. Two patients with tuberculous peritonitis without effusion and tuberculous processes in both adnexa were cured by an operation on the adnexa alone; two others with the same plus effusion, treated by an operation on the adnexa, died, as also two of five after a laparotomy (one moribund).

112 and 119. **Eclampsia.**—Schmidt thinks it is more than a mere coincidence that 6 women succumbed to eclampsia in his service in 1912, while only 3 of 17 died during 1911, although all were treated on the same principles. In his total 98 cases, 1907-1912, 23.47 per cent. of the patients died, including 19 of the 71 intrapartum cases; 2 in the 2 pregnancy cases, and 2 in the 15 post-partum cases. The mortality was 13.3 per cent. in the 15 cases with spontaneous delivery; 24 per cent. in the 45 operative cases; 13.04 per cent. in the 23 cases in which Stroganoff's method was applied and delivery was spontaneous, and 46.66 per cent. in the 15 Stroganoff cases with artificial delivery. It is possible, he remarks in conclusion, that venesection at once, on commencing the Stroganoff expectant, prophylactic treatment might improve the outcome.

Strempel protests against the general assumption that the Stroganoff method cannot be applied in the home but must be reserved for institutions, and relates his experience with four cases in which he applied this method in a wage-earner's home with complete success. He leaves the medicine with written directions for the doses, by the clock, impressing on the family the necessity for keeping the room dark and protecting the patient against noises and other external influences. A rectal syringe holding 10 gm. is left for giving the solution of chloral, one to four syringefuls as ordered. When the patient becomes able to swallow, the medicine is given in the same number of tablespoonfuls by the mouth. The morphin is also given in powder or solution in the same way except when he is at hand to administer it by subcutaneous injection. He keeps in constant telephone communication with the family, and when any change is reported, speeds at once to the patient. The success in the cases reported, with the aid only of the husband or midwife, was certainly brilliant, he declares, and justifies the adoption of the method by the general practitioner, possibly preceded or accompanied by venesection. (The details of the method were given in THE JOURNAL, July 3, 1909, p. 86.)

121. **Importance of Gonorrhea in Management of the Puerperium.**—Hannes warns that an old or latent gonococcus infection is liable to flare up and spread after delivery, and that this is a most cogent argument against allowing women to leave the bed soon after a childbirth. It is extremely important, further, on this account to distinguish which women already have gonococci before delivery; he makes a practice of having the women examined for gonococci just before delivery, and found them in 4 per cent. of 1,753 pregnant women in the last year and a half. These women are then supervised with special care. Even this does not reveal all those affected. In some other women supposedly free from gonococci and allowed to get up at the usual time, the temperature suddenly ran up and gonococci were then found in the lochia. On suspicion of gonococci, internal examinations should be scrupulously avoided, and the women should be kept absolutely quiet in bed for at least two weeks.

127. **Eclampsia.**—In this communication from Küstner's service, 158 cases of eclampsia are analyzed and the conclusion emphasized that the prognosis seems to be more favorable the sooner the delivery is completed. Early and rapid delivery is hence the basis for treatment. Rohrbach warns on principle against venesection before delivery, as one never knows how much blood is going to be lost intra partum. But

after delivery he regards it as a most important aid; he thus applied it thirty-seven times in thirty cases of eclampsia in the last six years, withdrawing 400 or 500 c.c. of blood at a time. Treatment after delivery is based on daily tests of kidney functioning and the pulse. Of the sixty-five patients with eclampsia before or during delivery, in the last six years, 16.92 per cent. died and 13.63 per cent. of the twenty-two women with post partum eclampsia.

Zentralblatt für Chirurgie, Leipsic

July 19, XL, No. 29, pp. 1137-1168

128 *Spreader to Hold Open Suppurating Process. (Verwendung von Spreizfedern bei der *Behandlung eitriger Prozesse.*) M. Tiegel.
129 Technic for Operative Treatment of Hydrocele. Müller.

128. Spring Spreader to Hold Open Suppurating Processes.—Tiegel has found very useful a little retractor with spring which holds the lips of a phlegmon apart after its incision and permits the escape of the thick secretions without the injury of tissues almost inevitable with other methods of treatment. Application of the spreader for even twelve hours transforms a phlegmon on the hand into a rapidly healing process, much shortening its duration and leaving the functioning unimpaired. He devised the little instrument for suppurating processes on the fingers in particular, but found it so useful that he now applies it regularly in mastitis, abscesses in the neck or around the kidney, etc. An illustration of it is given.

Zentralblatt für Gynäkologie, Leipsic

July 19, XXXVII, No. 29, pp. 1061-1100

130 *Unusual Fertility in Women. (Kasuistischer Beitrag zur Frage der *ungewöhnlichen Fruchtbarkeit des Weibes.*) F. v. Neugebauer.
131 Histologic Findings in Placenta in Determination of Age of Pregnancy. H. Peters.

130. Unusual Fertility of Women.—Neugebauer relates several instances from his own practice in which women passed through from twenty to twenty-four pregnancies, and mentions a case on record with thirty-five. In one of his cases after twenty-two uterine pregnancies came an extra-uterine. One of his relatives had twenty-four pregnancies and lived to a great age and ten of her children still survive.

Policlinico, Rome

July 13, XX, No. 28, pp. 989-1028

132 *Prophylaxis of Hereditary Syphilis in Foundling Asylums. (La profilassi dell' eredo-sifilide nei brefotrofi.) A. Gallico.

132. Prophylaxis of Inherited Syphilis in Foundlings' Asylums, Etc.—This entire number of the *Policlinico* is devoted to syphilis, with summaries of the more important recent articles on the subject in international literature. Gallico's is the only original article, and he states that the experiences with the Wassermann test have been most disappointing in infants' asylums. It was hailed especially in these institutions as promising to solve the ever-pressing question as to whether a foundling has a syphilitic taint or not, and thus whether it can be given to a healthy wet nurse or whether it is safe to give it to a syphilitic wet nurse. The test has proved a great disappointment. During the ten years 1901-1910, 3,432 infants were received and only 202 had unmistakable signs of syphilis. Of this group only thirty-nine developed symptoms during the first ten days; eighty-three between the tenth and twentieth day; three between the eightieth and ninetieth days; one not until after four months and one after five months. The Wassermann test was applied in sixty-four cases in which the ultimate history of the child was learned. In six cases the reaction was positive and the children developed symptoms later; in twenty-seven cases the response was negative and the children have never shown any signs of syphilis. In thirty-one cases, however, the response was negative and yet the course of the cases or the necropsy findings revealed unmistakable syphilis. Similar contradictory findings have been reported in Italy by Dalla Favera, Flamini, Serra, Gentile, Fua and Pennato. Some report a positive reaction when nothing at the time or during the years since has indicated the presence of syphilis.

Examination for the spirochetes is also misleading as they are discoverable only in accessible lesions. Forty-six of the children who were rather above the average size and weight developed symptoms of syphilis later. At present, he says, the only guarantee of approximate safety is to wait for fifteen up to forty days before deciding whether the infant is syphilitic or not; by the end of this period the question is generally decided one way or the other. Science to date has nothing better to offer.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

June 14, LVII, No. 24, pp. 1700-1790

133 *Value of the Syphilitic Index in Syphilis. (De Waarde van den Luetischen Index bij Lues en Paralues.) B. P. Sormani.

June 21, No. 25, pp. 1791-1878

134 Experiences with Meltzer's Intratracheal Insufflation. W. S. van Leeuwen.

June 28, No. 26, pp. 1879-1986

135 Separation of the Epiphysis of the Head of the Femur. (Loslating der Epiphyse van het Caput Femoris.) L. M. Metz.
136 *Pathogenesis and Treatment of Epilepsy. G. C. Bolten. Commenced in No. 25.

133. Practical Importance of the Syphilis Index.—Sormani's modification of the Wassermann reaction gives a definite index for the syphilis, and not only a qualitative but also a quantitative analysis; thereby serving as a guide in the treatment of the disease. This syphilis index has much in its favor in comparison to the opsonic index. It is delicate; gives always the same results; has a prognostic value, and in many instances indicates the stage of the disease. Sormani claims that the test deserves the name he has given it on account of its importance and practical value.

136. Epilepsy Due to Insufficient Thyroid Functioning.—In this lengthy article Bolten sets forth that "genuine" or essential epilepsy is a toxicosis caused by normal food-products, as well as by chemical cell products, when these products fail to be sufficiently neutralized by the action of the thyroid and parathyroid glands which normally serve to protect the central nervous system against toxins. The insufficiency of the glands in this protecting function may be secondary, due to some derangement of some part of the sympathetic nervous system. The changes found in the brain cortex are secondary, and are the result of the chronic intoxication. He declares that essential epilepsy is curable by thyroid treatment. By injections of fresh juice expressed from the thyroid and parathyroid glands of beef cattle, it is possible to cause a complete disappearance of the symptoms of essential epilepsy. He adds, however, that in many cases it is impossible to distinguish between essential and symptomatic epilepsy.

Hospitalstidende, Copenhagen

July 23, LVI, No. 30, pp. 821-844

137 Efficacy of Carbon Dioxid Snow in Treatment of Lupus Erythematosus. (Behandling af Lupus erythematosus ved Frysning med Kulsyresne.) P. Haslund. Commenced in No. 29.

Ugeskrift for Læger, Copenhagen

July 17, LXXV, No. 29, pp. 1220-1246

138 *Avoidable Cause of "Salt Fever" in Infants. (Undersøgelser over Kogsaltfeber hos spæde Born.) G. Jörgensen.

138. Salt Fever in Infants.—Jörgensen reports experiences and experimental research which have apparently established that the rise in temperature in infants after injection of salt solution is due to the same cause as the somewhat similar disturbances observed after injection of salvarsan in some cases, namely, to contamination of the water vehicle by the presence of toxic substances from the bodies of bacteria in the water. The bacteria are killed by the preliminary sterilization but the bodies are left, and this is sufficient to explain the "salt fever" in infants and the *Wasserfehler* after injection of salvarsan. His findings call for a revision of all the work on "alimentary fever" in infants, as he found that the rise in temperature followed constantly when the salt solution was made with distilled water which had stood for some time, while it was never observed when the water was freshly distilled. Consequently the statements as to the danger of subcutaneous infusion of salt solution in infants are shown to be unfounded if the water is free from bacterial contamination.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

Vol. LXI, No. 9 CHICAGO, ILLINOIS AUGUST 30, 1913

A FINAL WORD TO THE FELLOWS AND MEMBERS OF THE AMERICAN MEDICAL ASSOCIATION [*]

A. JACOBI, M.D.

NEW YORK

The duties and responsibilities of your presidents are such as to prevent them from addressing you frequently in your open meetings. That is why I avail myself of the courtesy of the Editor of THE JOURNAL, which permits me to deliver a brief valedictory to my friends all over the country and to add some remarks in connection with the subject discussed in the inaugural address[1] I delivered on June 4, 1912.

Advancing years have added to the greatness of the edifice called the American Medical Association. It has served you, its constituents; it has benefited the American people. From year to year its scientific work has expanded and its civic importance increased. Its Judicial Council and its councils on Health and Public Instruction, Medical Education and on Pharmacy and Chemistry, have submerged scores of inferior medical schools, enlarged knowledge, opened new horizons and fastened the links between all classes of citizens.

Not to lag behind my own obligations as a citizen of the land and a physician of the people, I tried a year ago to trace for you a part of the neglected congenital and earliest causes of the 17 per cent. of the early infant mortality, which trace their origin to embryonal and fetal life, and to the dangers of parturition and vicissitudes of the first days and weeks of the new-born. The vast number of infant deaths and the still greater amount of woman's invalidism and decrepitude were merely referred in part to social shortcomings, to the prevalence of the sickly incompetency which is called charity, to the lack of state or municipal responsibility, and to the inefficiency of medical and other service. Such service when inadequately rendered by doctors and midwives and nurses has been frequently and vociferously censured for its inefficiency.

Having shared in that kind of work part of these sixty years I bow my head with the rest of us, but I do not graciously submit to the reproaches heaped on the obstetric professors who always promise the achievements they expect in future of their medical students. On the other hand, I cannot agree with the complaint that when professors are teaching midwives, "medical students are deprived of their teachers' time"; nor do I fear with a modern author lest the midwife compete with the physician. That has been said in earnest, still it is only ludicrous. I want here to repeat merely the objects of English midwifery schools, which are "the care of the expectant woman, the conduct of normal labor, the care of babies immediately after birth, and the simple principles in an urgent case of artificial feeding."

At my time of life my opportunities to do good may not be many. That is why I refer in a few sentences to my discussion a year ago on what I considered the best means of combating infant mortality. The attention this topic has aroused has been close and various. Now a vast number of papers and pamphlets and books have been written to illustrate the subject of artificial feeding of the infant. It is no longer indicated, however, to rehash the fact that no less than 20 per cent. of the babies when fed on conscientiously selected artificial food will die before the first year of their lives terminate, while only 7 per cent. will be carried off when fed on human milk. In the brief space at my disposal to-day I shall not return to that topic.

I also directed your attention to the many causes of death acting before and immediately after birth, many of them not counted in mortality statistics. Indeed, officially, stillbirths are in most of our states not considered at all. One of those causes is the absence of proper attendance on the mother during pregnancy, and during and immediately after labor. I discussed the shiftless lack of attention paid to the expectant woman and to the necessity of teaching and licensing and supervising midwives.

I emphasize the subject again, thinking, as I then thought, that the communities and the commonwealths have no more important and beneficent service to render to themselves and to the nation, and that the President of your Association and the members of our profession have no more dignified duty than to contribute to the salvation and the well-being of the people. I have nothing now to add to my statements contained in THE JOURNAL[1] last year and the *Medical Record* and the *New York State Journal of Medicine* of the same date, and nothing to report which would amount to a criticism of a number of papers written since that time —a few directed against the position taken by me. Some are contained in the "Transactions" of the third annual meeting, held at Cleveland, Oct. 2-5, 1912, of the American Association for the Study and Prevention of Infant Mortality. I beg to insist on your spending an hour, every one of you, on the fifty pages dedicated to the chapter on midwives. If there you read in the paper contributed by an obstetric professor, as also in a similar production of his which appeared this year in THE JOURNAL,[2] about your President's "utter foolishness" in making certain recommendations, you must not, I hope, drift away from your knowledge of the advisability of hearing both sides.

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[*] Publication unavoidably delayed.

[1] Jacobi, Abraham: The Best Means of Combating Infant Mortality, THE JOURNAL A. M. A., June 8, 1912, p. 1735.

[2] Ziegler, C. E.: The Elimination of the Midwife, THE JOURNAL A. M. A., Jan. 4, 1913, p. 32.

This I know: that last year I rose before you because I knew that neither you nor I had a more important interest or a more urgent duty than to look out for the necessities of the people, of which after all the professors are only a small and sometimes an insignificant part. In the opinion of my critic I have taken "a decidedly backward step" as regards both the teaching and practice of obstetrics; but in my remarks I never thought of obstetric teaching in the medical schools. A "backward step" would amount to a step into something like a nonentity. For he cannot help quoting an authority according to which only a single school in America has adequate facilities for properly teaching obstetrics to American students.

According to Abraham Flexner, thirty-one medical schools of the same high standard as one he mentions are needed in this country. To supply them thirty million dollars and from fifteen to twenty years at an annual outlay of three million dollars are required—so we are informed—for affording an adequate instruction in obstetrics to our medical students. These students must have the privilege of commanding, so it is asserted, all the material to practice on and to learn by. What is meant by "material"? Nothing else but the present and future mothers of your fellow-citizens. That is why the outlook in Pittsburgh with its recent combination of hospitals and dispensaries is said to be very promising. Promising of what? I said a year ago and say again that I do not care to wait fifteen or twenty years for the promise held out to future students or doctors whose primeval forest of ignorance is generally deplored by those who ought to know from their professional experience, and I repeat that I respect and urge the right to live, as much of the hundreds of thousands of women and newly born of to-day, to-morrow and a year from now, in the towns and in the rural inaccessible solitudes, as those who are to follow in twenty years.

In my inauguration address of last year I did not care to refer to the future instruction in obstetrics for the students of medicine in Pittsburgh and elsewhere, and for future practitioners. I dealt with the salvation by sufficiently instructed midwives now and forever, of women and their infants. My subject was confined to hundreds of thousands of them in the ghettos, the congested city quarters and the rural districts into which you and perhaps I do not easily descend; in which no doctor of skill and knowledge is tempted to locate. In Pennsylvania alone there are 100,000 births annually in rural places with no hospital near; with no opportunities for clinical services of large cities, and very few ill-prepared and overworked doctors.

The student question is another problem. For that opinion of mine a professorial oracle calls me a fool—an "utter fool," when it is he who unskilfully changes the topic under consideration and who clinched his arguments by merely quoting himself a second time literally and repeating his convictions of my "utter foolishness." If this is presented as an argument, it is a serious matter and not to be touched with a silk glove. My horizon and years extend beyond the pelvis of the poor woman of the large cities blessed with a medical school and an eager professor. It comprehends the necessities of what is called the student material, meaning the upper and lower classes of the people at large. But after all, I do not recognize the division of our people into superior and inferior classes. The superior rich are too often useless Americans. They have not even children. The so-called inferior create the wealth of America in children, in labor and in brains, and the back-bone of the land. These derided inferior classes, your "material," gave us the Lincolns, the Clevelands, the George W. Curtises and the Carl Schurzes.

What has the nation done for them? From an unprinted late report of the Committee on Blindness of the New York Association for the Blind, which I am permitted to use, I take the following facts:

Midwives are allowed by law to practice unrestricted in twelve states, Alabama, Arizona, Arkansas, Florida, Georgia, Idaho, Kentucky, Maine, South Carolina, Tennessee, Virginia and West Virginia.

There are no laws relating to the training, registration or practice of midwives in fifteen states, namely, California, Delaware, Massachusetts, Michigan, Mississippi, Nebraska, New Hampshire, New York, North Dakota, Oklahoma, Oregon, Rhode Island, South Dakota and Vermont. In the twenty-two states in which there are laws relating to midwives, fifteen require that they shall be licensed and that they shall pass an examination before being licensed to practice, while nine restrict the practice of midwives to attendance on normal cases. In no state is there provision by state law for supervision of midwives in their practice. In six states it is required that midwives shall be trained, but in no state are there any standardized schools. Only Bellevue Hospital, the Philadelphia City Hospital, where women are received for midwifery training on the recommendation of the board of medical examiners, St. Louis, and lately Newark, N. J., have schools. Meanwhile, so far as officially known, 34 per cent. of all cases of births in the whole country are reported by midwives. Unfortunately, however, the statistics are wofully incomplete.

Of other information I submit the following:

In 108 cases of ophthalmia neonatorum that are reported by various eye clinics, sixty-two patients were attended by physicians, forty-three by midwives, and three by neighbors. Of the sixty-two, prophylactics were used in fourteen; of the forty-three, in eleven. Out of eleven, six lost one eye, three were merely scarred, and three were blind. It so happened that all the cases of total blindness occurred in the practice of physicians.

Literature is getting too large. So many papers are published that nobody has time to read them. Everybody has just time to miss or forget, or to bury in waste-paper baskets, which profit of most of them.

Now, are our fault-finders correct? Are more babies saved, more women kept in health by a promise of erudite and well-prepared doctors of the future? Is sepsis of the lymph-vessels, the pyemia of the blood-vessels to-day prevented by promises? Even the German Empire has 15,000 cases and 5,000 deaths annually of puerperal fever. Prussia alone, 5,044 and 1,772, for the doctors in these countries are officially admitted to be immature, and the number of midwives, trained in a year, insufficient in numbers. They know how to keep accounts in Germany. There the deaths from puerperal fever are 35.1 per cent., compared with scarlet fever 7.8 per cent., diphtheria 11 per cent., and typhoid 14.1 per cent., and ours, no matter whether they are called puerperal fever or peritonitis, or nephritis, or pneumonia, are surely no less. After all, acknowledging the drawbacks of our social conditions, what I demanded was nothing but less work, less filth, less starvation, less physical and factory work of the pregnant woman and new mother, and altogether better social conditions. Indeed, more hospitals are required by those who cannot help preferring absence from their homes. After all, however, it is only the primipara that should be offered and accept a bed in the hospital. The woman with children belongs to her home, where her mere presence is wanted as a protection to her flock.

It is true, the Lying-In Hospital of the City of New York, which is the admirable creation of J. P. Morgan, has succeeded in aiding during 1912, outdoor and indoor, in 5,600 cases of confinement, but in the same year eight times as many confinements were attended by midwives, good, bad and indifferent.

Modern institutions like this, like modern Morgans, are welcome. I wish, however, there were no social conditions which make them necessary. Still I must wish there were more like them. After all, as you cannot have them, and not even enough professors or doctors to go around, be sure not to "eliminate"—that is the pet modern expression—the midwife, but to see to her municipal, state or national education, training, licensing and supervision.

FETAL PERITONEAL FOLDS

AND THEIR RELATION TO POSTNATAL CHRONIC AND ACUTE OCCLUSIONS OF THE LARGE AND SMALL INTESTINE *

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In the region of the caput coli and ileocecal junction, there appear frequently after the fifth fetal month certain peritoneal folds of fairly constant form and distribution which stand forth without manipulation and spread out so prominently that they can scarcely be overlooked. They are either anatomic or pathologic entities, and surely are not brought into existence by any artifice of traction or manipulation.

Frequently sheets or broad bands of serous membrane pass from the mural peritoneum over the front of the cecum and ascending colon, sometimes greatly lessening the caliber of this part of the large intestine. These are the bloodless fold of Treves and the parietocolic fold. The latter, according to Douglas Reid, was first described by Jonnesco. It resembles the pericolic membrane of Jackson as seen in children and adults.

Other fetal folds suggest by their position and attachments a causal relationship to gravitations and angulations of the terminal ileum. For example, the genitomesenteric fold described by Douglas Reid of the University of Cambridge, a fetal fold which passes from the mesentery of the terminal ileum down into the pelvis attaching below to the genital gland, bears an interesting resemblance to the so-called ileopelvic band, an anomalous band occasionally passing from the terminal ileum into the pelvis in the adult, to which Mr. Arbuthnot Lane ascribes an important rôle in the causation of Lane's kink. Figures 1, 2 and 3 show the genitomesenteric fold of Reid. These are photographic enlargements of smaller photographs sent to me by Mr. Reid, and are part of a set similar to that recently accepted by Professor Keith for the Royal College of Surgeons.

Reid's genitomesenteric fold is continuous above with the duodenorenal ligament of Hueschka, and we have here at least a speculative explanation of the kinking upward of the terminal ileum. Another fold not above suspicion in cases of upward displacement of the terminal ileum is the rather constant ileocolic fold which, if contracting, would draw the terminal ileum upward and toward the ascendong colon (Fig. 4). Likewise the so-called root folds, as the left or superior root fold shown in Figure 5, or the right root fold, the mesentericocecal fold of Jonnesco, which are ridge-like upward reflections of the mesentery, indicate the marked tendency to irregularities of attachment and upfoldings of the mesentery.

I have had little difficulty in finding Reid's genitomesenteric fold in fourteen out of thirty-two fetuses examined (Fig. 6). I have also been able to demonstrate it in the adult where it had caused a kink and where it had produced no kink of the ileum. By picking up the terminal ileum in an adult, a tall, sickle-shaped fold of peritoneum passing from the mesentery of the terminal ileum to the internal abdominal ring came up much too freely to admit of suspicion of its having been produced by traction. Reid likewise has demonstrated the genitomesenteric fold in the adult. Illustrations in one of C. H. Mayo's published articles show a band corresponding precisely to Reid's fold which he divided for the correction of a Lane's kink.

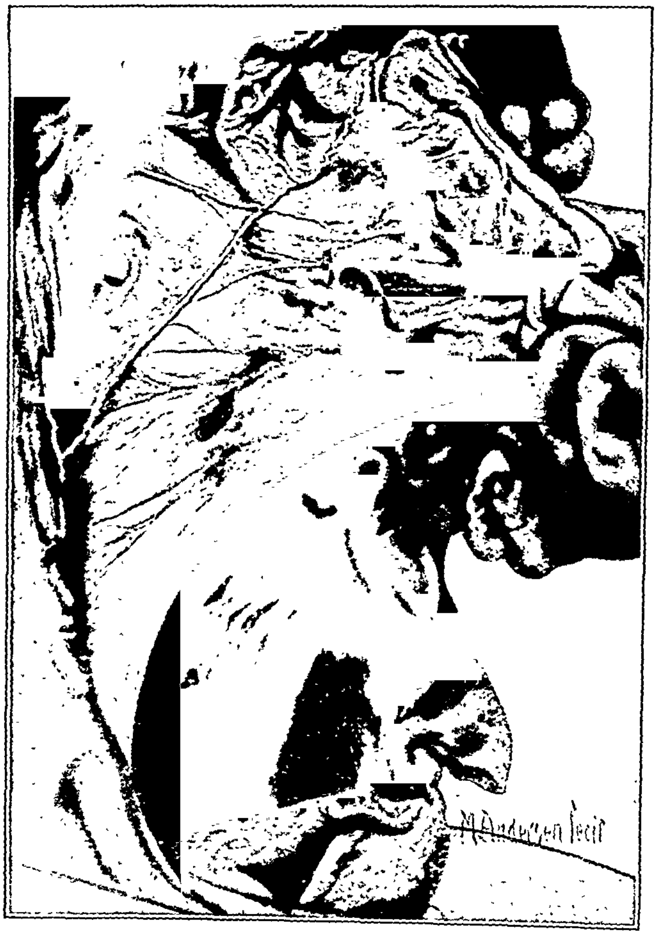

Fig. 1.—The genitomesenteric fold of Reid. The white sickle-shaped band is seen passing from the terminal ileum down into the pelvis.

Mr. Lane[2] describes his ileopelvic band as a new or acquired distinct peritoneal ligament which attaches itself progressively to an area of the ileum more and more distant from the attachment of the normal mesentery. If Lane's ileopelvic band is not a persisting fold

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* Read in the Section on Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

* Because of lack of space, this article is abbreviated in The Journal. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped addressed envelope.

[2] Lane, W. Arbuthnot: Brit. Med. Jour., May 4, 1912.

of Reid, it is an interesting coincidence that the fetal structure should be precisely similar in its position and attachments to the adult band; and if, as Mr. Lane says, and as I have no sufficient reason to question, this fold is due to a crystallization of forces to resist the descent or displacement of intestines, then this crystallization surely takes place in fetal development.

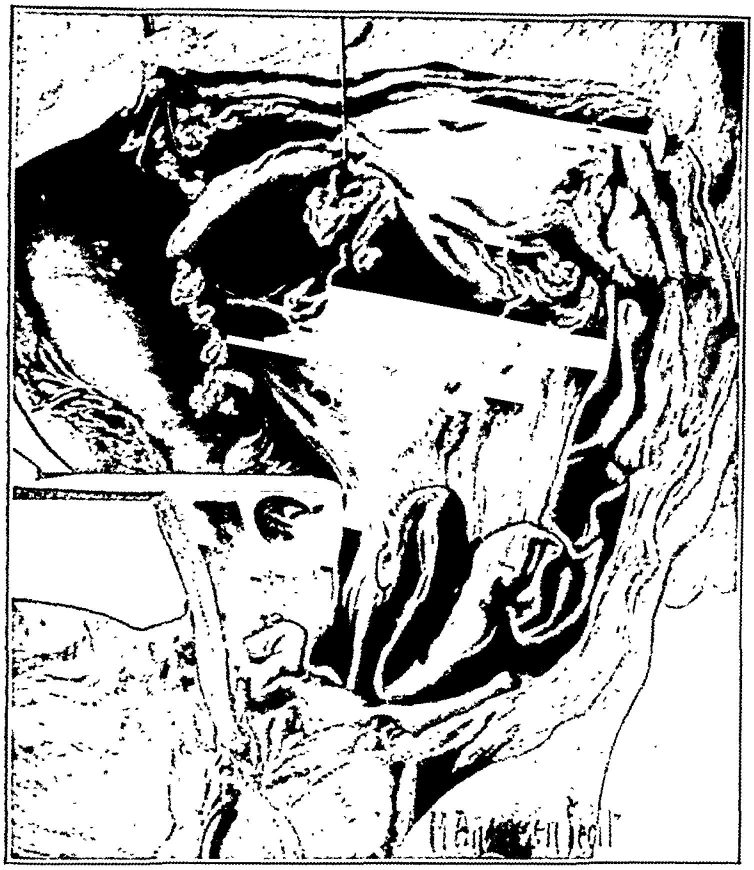

Fig. 2.—A genitomesenteric fold of Reid passing upward from the genital gland to the mesentery of the terminal ileum.

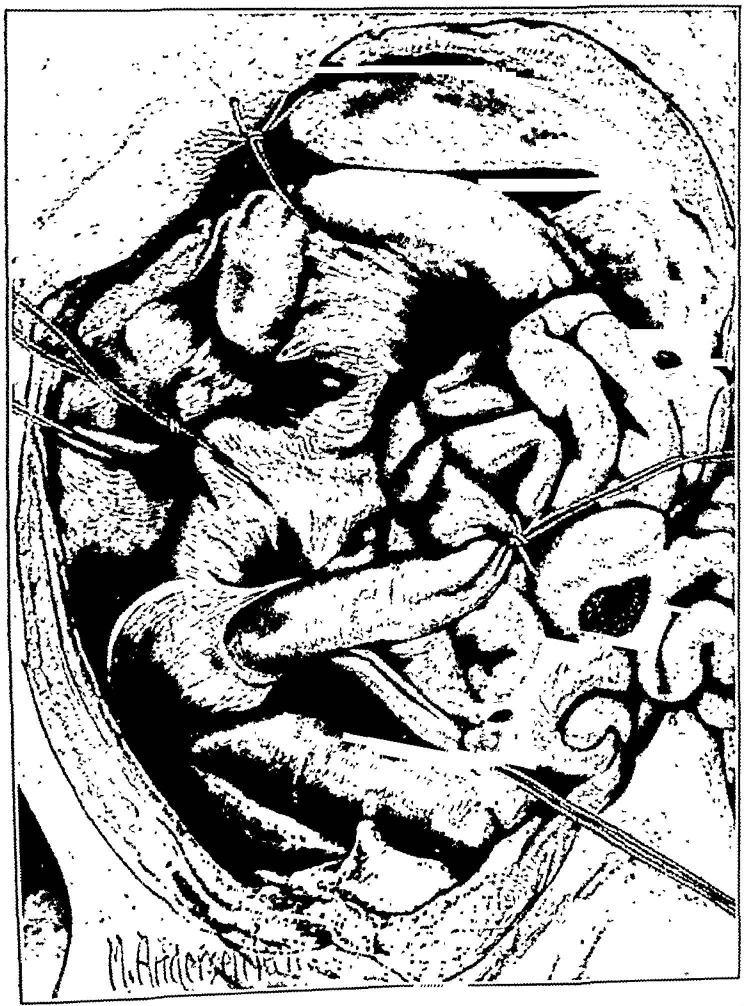

Fig. 4.—The ileocolic fold extending from the upper lamina of the mesentery of the terminal ileum around over the cecum.

In the case of the genitomesenteric fold, a simple if somewhat suppositional explanation of origin is that in the descent of the right ovary or testis the dorsal peritoneum is caught and dragged or drawn out into this form.

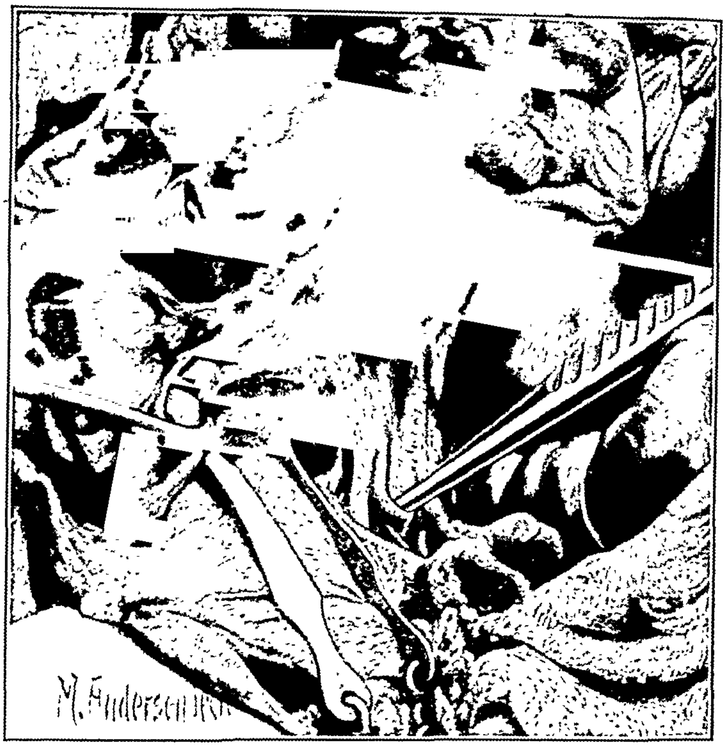

Fig. 3.—The genitomesenteric fold of Reid. A heavy band passing from the terminal ileum into the pelvis.

There is considerable evidence to support the assumption that the bloodless fold of Treves begins as an adhe-

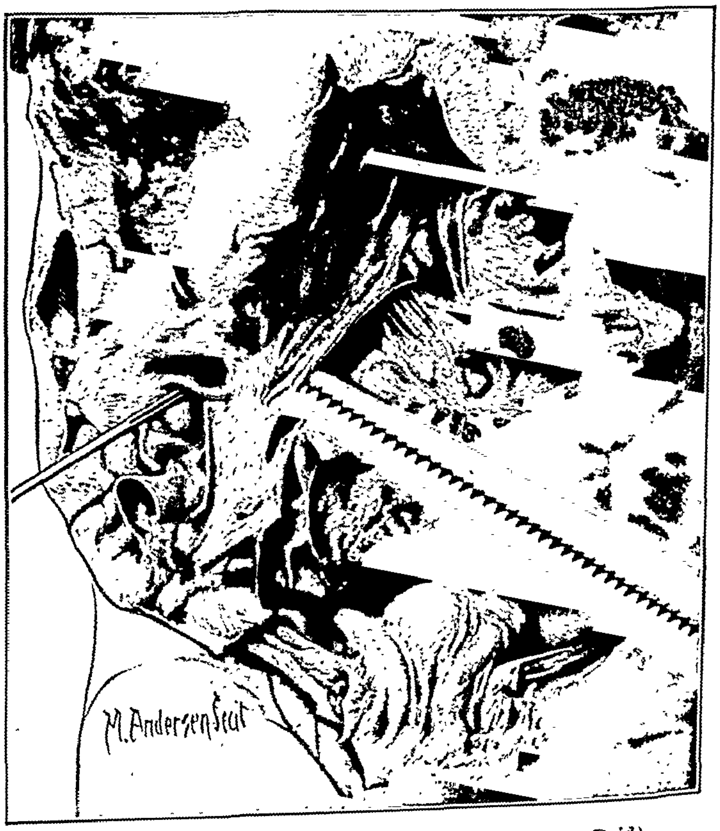

Fig. 5.—The superior root fold (after Douglas Reid).

sion between the cecal head and the mural peritoneum, as shown in Figure 7, and that later in the act of cecal torsion the caput coli rolls itself, so to speak, in serosa drawn over from the very loosely applied peritoneum of the lateral abdominal wall, as a man rolls himself up in a blanket; for the bloodless fold of Treves may be found as a short band of adhesion, as shown in Figure 7, as a somewhat longer band as shown in Figure 8 (dissection of an adult by Reid), or as a sheet long enough to extend from the lateral abdominal wall, beginning at a point opposite or below the level of the cecal head, and extending upward and inward, to be attached to the mesentery of the terminal ileum, and forming a shirt-pocket-like fossa in which the caput coli and vermiform appendix may lie ensconced (Figs. 9 and 10). It seems fair to suspect that the parietocolic fold is formed by similar fusion at a higher level.

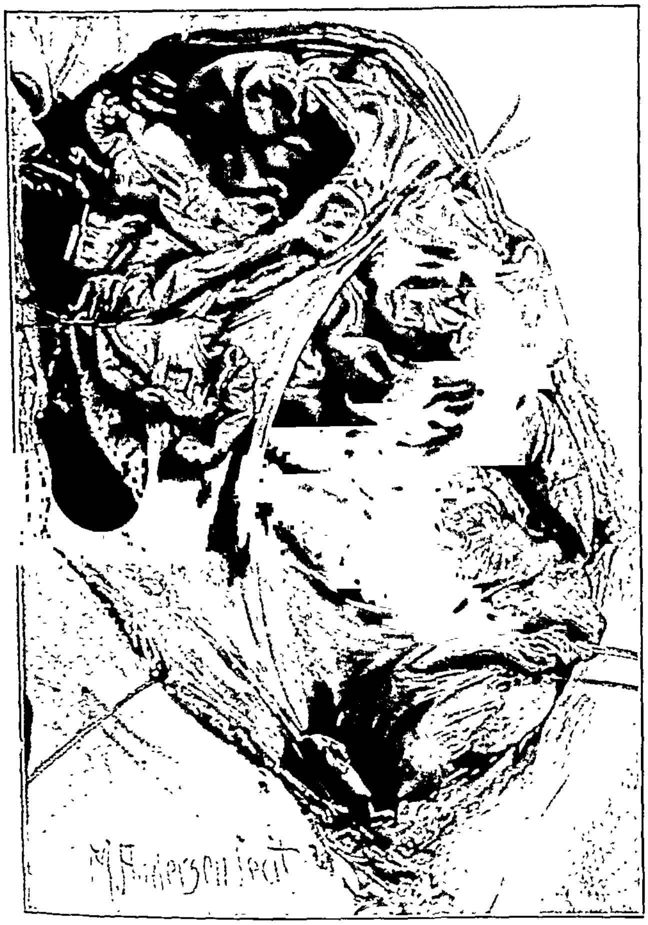

Fig. 6.—The genitomesenteric fold of Reid is the sharp sickle-shaped band at the right of the picture. Laterally to this band is the bloodless fold of Treves passing from the mural peritoneum to the caput coli.

It may fuse with the peritoneum covering the caput coli.

I believe that the bloodless fold of Treves not rarely persists in the adult, and forms the boundary of a precolic fossa in which the cecal head and appendix may be tightly embraced (Fig. 9); and further, that during operations for appendicitis, it is likely that the caput coli with the appendix is not rarely shelled out of this anomalous peritoneal pocket; the peritoneal membrane, that is to say the bloodless fold of Treves, which forms the pocket, being looked on by the operator as an affair of adhesion formation.

Another rather common fetal fold which, persisting and contracting, may bind down the appendix or envelop it, is illustrated in Figure 11. Here a skirt-like fold

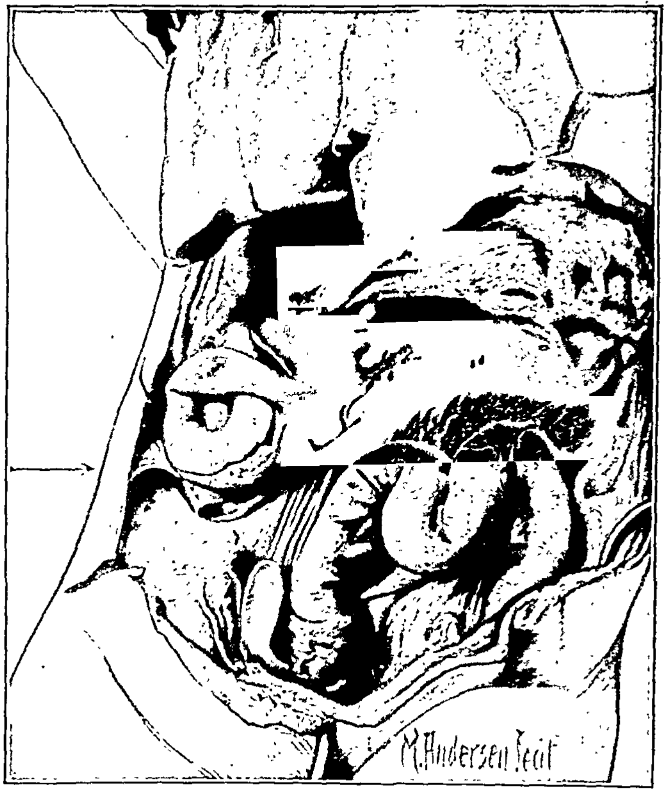

Fig. 7.—A beginning bloodless fold of Treves being formed by the stretching out of an adhesion forming between the caput coli and mural peritoneum before normal cecal torsion (after Douglas Reid).

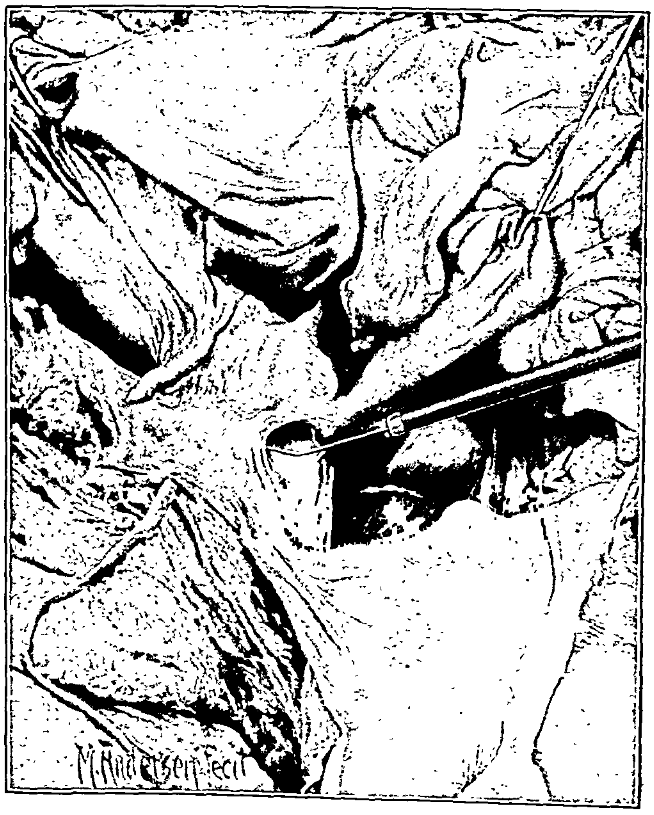

Fig. 8.—A bloodless fold of Treves somewhat more fully developed than the narrow adhesion-like fold in Figure 7. (Enlargement of photograph by Reid.)

passes from the terminal ileum above, downward around the appendix, embracing the basal half of the appendix, and then passing upward is inblended with the serosa of the caput coli. The appendix rests in this fold like a man seated in a hammock, or like an injured forearm placed in a sling. (Fig. 11.)

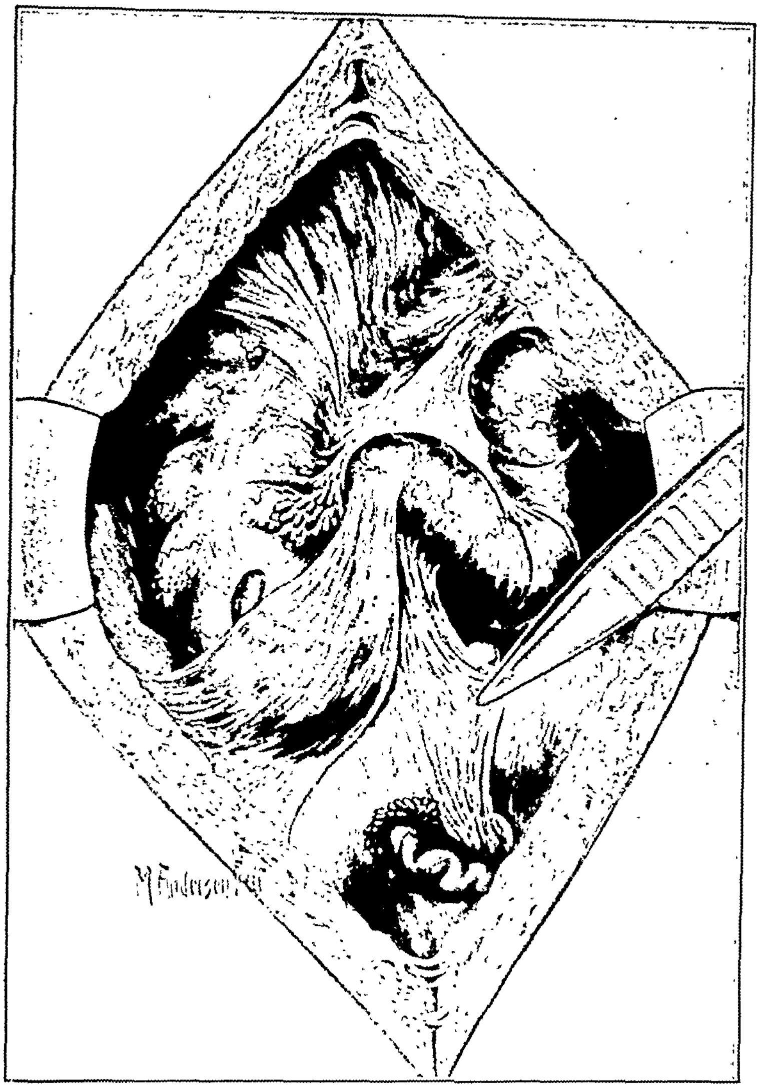

Fig. 9.—Above, the parietocolic fold of Jonnesco passing from the mural serosa across the ascending colon to the inner lamina of the meso-colon. Below to the left the bloodless fold of Treves forming a sconce from which in adults the caput coli must occasionally be shelled out. To the right below the genitomesenteric fold of Reid.

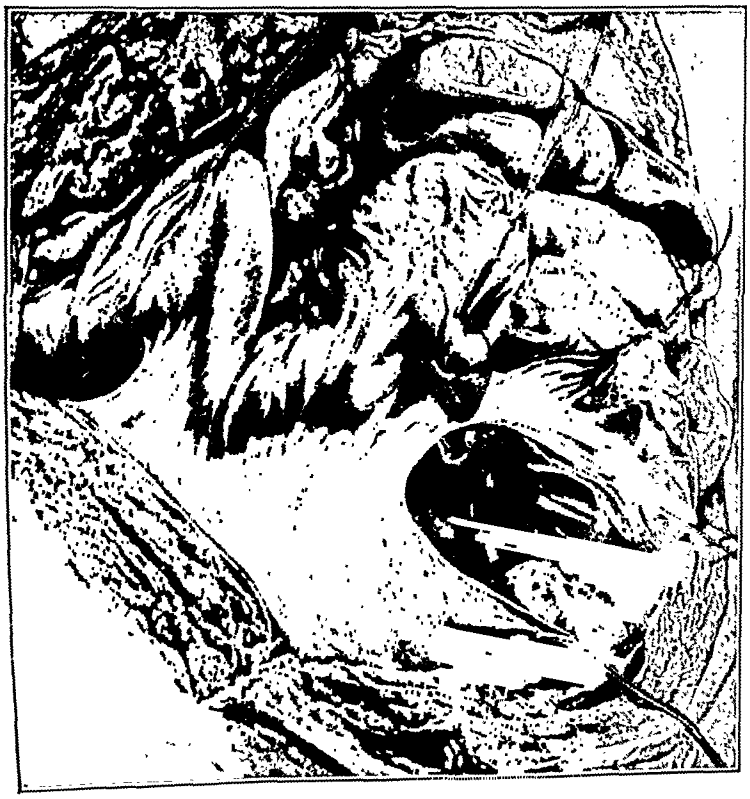

Fig. 10.—The bloodless fold of Treves passing from the mural serosa to the cecum.

Douglas Reid and Byron Robinson have called attention to adhesions of the colon to the peritoneum of its own mesentery. That is to say, along the line where the lateral mural peritoneum passes over to become the peritoneum of the outer lamina of the mesentery of the ascending colon, it first passes up for a short distance, as an upward reflected fold adherent along its upper border to the ascending colon laterally, then passing down and again upward and around over the ascending colon to form its normal peritoneal covering. I have

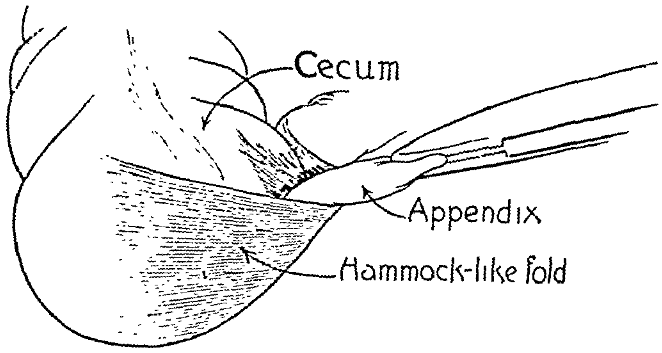

Fig. 11.—A fold passing from the terminal ileum around and below the vermiform appendix and passing upward over the caput coli. The appendix lies in this fold like an injured forearm in a sling.

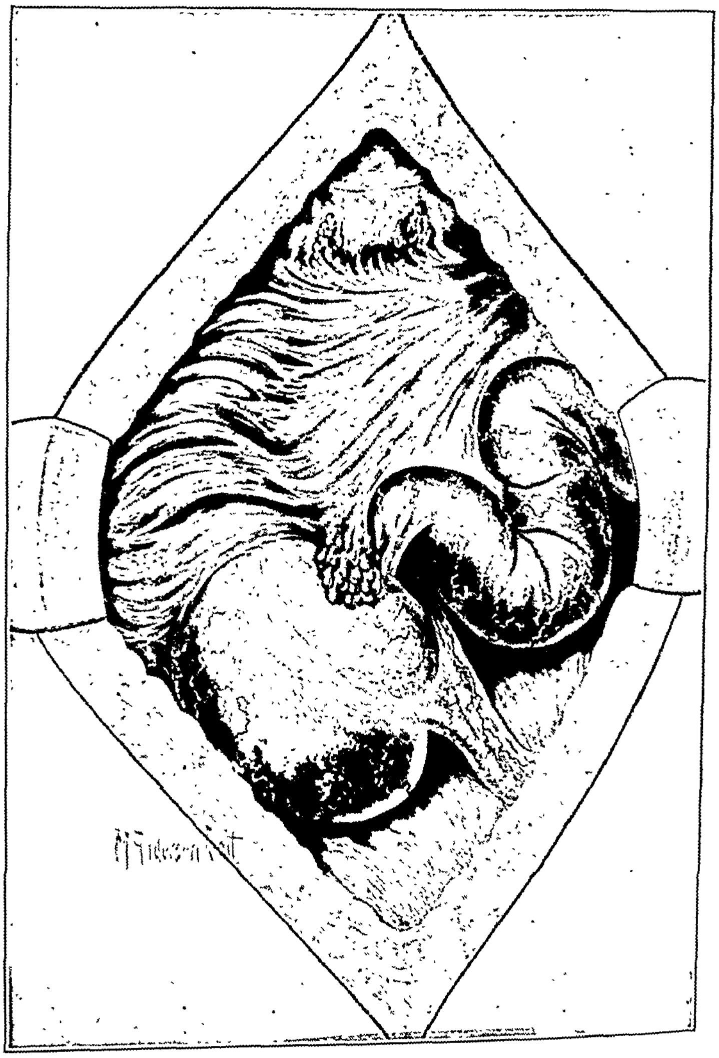

Fig. 12.—A parietocolic fold or Jackson's membrane which produced an acute complete obstruction of the ascending colon with ileus. Blood-vessels passed freely from this anomalous sheet over on the mural peritoneum.

seen in operations on the adult the peritoneum of the mesentery of the ascending colon reflected upward and adherent to the colonic peritoneum for a distance of 5 or 6 inches.

As it was also seen by Douglas Reid in the fetus, it does not seem unfair to suspect this upward reflection of the mesenteric peritoneum of being a persisting fetal adhesion. We have here presumptive evidence that Jonnesco's fold or the parietocolic fold is due to adhesion between the cecum and the mural serosa before cecal torsion has taken place, and that with subsequent rolling inward a sheet of peritoneum is drawn from the lateral abdominal wall as it rolls from left to right.

Reid describes two cases in which the parietocolic fold was formed by a large appendix epiploica. The first step in the development of the parietocolic fold and of the bloodless fold of Treves may be made clearer by assuming that before cecal torsion takes place a large appendix epiploica or several appendices epiploicae become adherent to the parietal peritoneum and elongate and spread out as the colon rolls over from right to left.

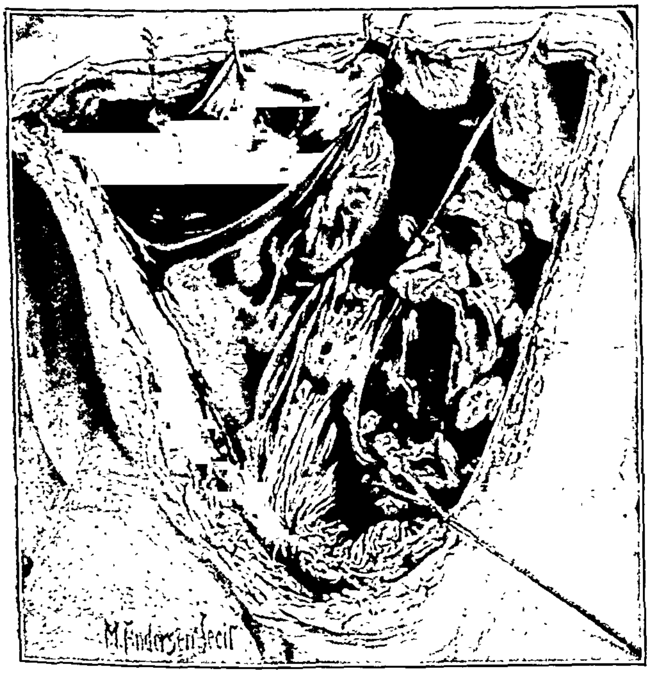

Fig. 13.—A parietocolic fold producing strangulation of an ascending colon in a fetus, a condition strikingly similar to that observed in an adult and illustrated in Figure 12.

So far as I am aware, however, no causes have as yet been reported in which a pericecal membrane completely strangulated the large intestine, producing acute obstruction with ileus. That extensive pericecal membrane formation may lead to acute complete obstruction was shown by the following observation:

REPORT OF CASE

Jan. 18, 1912, R. H., aged 24, was admitted to the surgical service of the Indianapolis City Hospital with a provisional diagnosis of acute obstruction of the bowel. On failure to obtain results from high enemas the abdomen was opened, and I was able to demonstrate a tight compression of the ascending colon, as illustrated in Figure 12. A distinct, smooth, continuous sheet of anomalous peritoneum was not present. The membrane was web-like, and to some extent loculated. There was little doubt, however, that it was an anomalous peritoneal covering which was continuous with and passed from the mural serosa, over the ascending colon, to be inserted in the inner side of the mesentery of the ascending colon, for the blood-vessels passed freely from the membrane onto the mural serosa. There was no sign of infection or inflammation anywhere in the abdomen. The membrane was split up with scissors on the operator's finger as a guide, passed between the anomalous membrane and the normal peritoneum of the ascending colon. The man recovered duly, and up to the present has had no recurrence of his trouble. I have twice seen in the fetus a pericolic membrane tightly compressing the ascending colon (Fig. 13).

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SURGICAL ASPECTS OF INTESTINAL STASIS, FROM AN ANATOMIC POINT OF VIEW *

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OMAHA, NEB.

It seems to me that it would be like carrying coals to Newcastle to attempt to discuss the subject of intestinal stasis in any but a restricted sense. Much has been written about intestinal stasis, from the points of view of both the physician and the surgeon, but nothing of great importance has been added, throwing light on it, from the surgeon's standpoint, which has increased our knowledge beyond that which we received from Lane and Jackson. Lane may be an extremist and his surgery may need some toning down, but his deductions are based on sound premises. Jackson made a great discovery in his "pericolic membrane," and his clinical diagnosis of its presence and the attending pathology has not been improved—it is standard.

During the past year two notable papers have appeared, one by Flint, in the Johns Hopkins Bulletin, and the other by Rilus Eastman (*Journal of Surgery, Gynecology and Obstetrics*), read before the Western Surgical Association, which settle conclusively the mooted point as to the origin of the much-discussed peritoneal bands and membranes of Lane, Jackson, Jonnesco, Reid, Treves and others. They are all congenital and have been recognized and described by anatomists for generations, but that any one of them had a clinical significance other than in the formation of fossae for the possible development of retroperitoneal hernia, appears to have escaped attention until Lane and then Jackson recognized and demonstrated the fact. Lane himself says that after he had called attention to the mechanics of chronic intestinal stasis, the existence of the membranes and bands which he is pleased to designate "acquired mesenteries and adhesions" were "absolutely and categorically denied by physicians experienced in post-mortem work, who appeared to think that, because they had escaped their observation as many things have done and will continue to do, they were justified in denying their existence in the most dogmatic manner possible."

Last summer I had the opportunity of seeing and examining some of Mr. Lane's patients before operation, witnessing his work and examining and talking with some of his patients who were convalescent from operations for the relief of chronic intestinal stasis. So favorably was I impressed with the reality of the subject that during the past year I have sought every opportunity for enlightenment as well as a critical study of my own patients, in order to come to some conclusion for myself as to the frequency of the membranes and bands considered responsible for the symptoms of intestinal stasis from its mildest to its most severe forms. In my experience as I have gained better opportunities for observation through longer incisions, I have come to the conclusion that membranes of the pericolic type of Jackson may be found in every abdomen, if not on the right side in the lower, middle, or upper quadrant, then in the lower left quadrant. We must ever bear in mind that in great measure, the relative relations and displacements of the viscera depend on the conformation of the skeleton, and that there are quite as great variations in the abdominal viscera as there are in the faces of their owners. As before stated, these delicate membranes which we find about the ascending colon, ileum, cecum, involving or not the vermiform appendix, have been described by anatomists for generations. It is the rule rather than the exception that when they do produce symptoms it is in adults, and not in children. Many times the adults are beyond 50 years of age, and up to the time of the commencement of the symptoms, there has never been a sign of anything wrong within the abdomen that could be attributed to the membranes. Therefore these membranes should be regarded as purposive rather than offensive. All of the different types of these membranes may early become offensive, producing angulations of the bowel with their necessary consequences. These instances are congenital defects the same as are cleft palate or supernumerary toes. Continued abuse of function, particularly of the cecum and ascending colon, results in loss of tone, and the membranous supports always present in greater or less extent in every individual, instead of being conservative, become restrictive in the same sense as I have shown elsewhere that the chest wall hinders the action of the damaged, tethered heart in adhesive mediastinopericarditis, and that the overlying ribs should be removed in order that the heart may functionate with less strain. Displacements and angulations of the intestines resulting from peritonitis, localized or more or less general, bear no relationship to any special clinical history, and each is a law unto itself; whereas the different disturbances connected with congenital membranes of the type under consideration all have a rather definite history, which can be recognized by the man of keen wits, and when the symptoms cannot be relieved by a careful study and regulation of the diet, and the use of a mechanical laxative such as paraffin, these cases become surgical. The last word has not been said as to the best technic to be followed in any individual case. Some of Mr. Lane's work appears too radical; among neurasthenics, I believe his technic of ileosigmoidostomy will sometimes fail if a catarrh of the mucomembranous type is present, unless there is added a fistula into the cecum for long-continued irrigation of the colon. In a paper which I had the honor to read before the Chicago Surgical Society, March 6, 1905, entitled "The Surgical Treatment of Chronic Mucomembranous and Ulcerative Colitis, with Special Reference to Technic," I advocated strongly the operation of Monprofit, in exclusion of the colon; it is known as "exclusion with drainage into the intestine," and is intended chiefly for obstructions in the colon. The ileum is divided far enough away from the ileocecal valve so that the divided ends can be implanted into the colon—the proximal end above, the distal end below, into the sigmoid or pelvic colon. In spite of theoretic objections to the contrary, the fluids from the excluded part of the colon drain through the ileocecal valve into the stump of the ileum, on into the sigmoid flexure. It would seem an improvement over this method of Monprofit's, if employed in chronic intestinal stasis, that instead of dividing the lower ileum, it be approximated to the sigmoid and two anastomosis openings made; between these openings the ileum should be occluded by a purse-string suture, and both limbs fastened to the sigmoid so as to close any opening that might permit of a loop of intestine becoming strangulated. In ileosigmoidostomy, reliance on Lane's last kink, congenital or artificially made, never appealed to me, because in this situation the intestinal wave is antiperistaltic, which was so beautifully demonstrated by Cannon years ago. This kink will hardly prevent a backward flow into the colon; if not competent to do this, the valve will dam back the accumulated feces above, since the *vis a tergo* and peristalsis have been removed by diverting the intestinal flow from the ileocecal valve.

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* Read in the Section on Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

Where the cecum and sigmoid are sufficiently mobile, an anastomosis between them seems a practical solution and a relatively mild procedure. The paper above referred to as read in Chicago was based on my experience at that time, of eight cases operated on for chronic mucomembranous colitis. Four had a Gibson fistula made into the cecum for irrigation, and two had, in addition, the ileum divided, the lower segment occluded and the upper implanted into the sigmoid. One of my operations was after the technic of Maisonneuve. In these operations the appendix was removed, as the mucomembranous colitis was supposed to be secondary to a chronic appendicitis. My knowledge and recollections to-day tell me that the true reason of the inflammation was an intestinal stasis (our old-fashioned auto-intoxication), a Jonnesco-Reid genitomesenteric fold aggravating the difficulty. Removal of the colon is too hazardous an operation if an intestinal exclusion operation can be carried out in a successful way. The cecum, especially when not supported by a parietocolic membrane, may be large and mobile. In 30 per cent. of adult people with a large mobile cecum, symptoms referable to this condition are clinically present. The symptoms are present *not* because the cecum is large and mobile, *but* because its walls are flabby and it has lost the power of emptying itself properly. The condition is corrected by a plication operation, supporting the cecum or not, as indicated. The common ptoses of the transverse colon, sometimes into the pelvis, resulting from neglected function of the congenitally weakly supported viscus, are well handled after the technic of Coffey. As a rule most congenital membranes of the pericolic type are best released at their loosest line of attachment by passing some blunt instrument under the membrane along this line and dividing it. In other cases in which greater mobility seems desirable, the compressed intestine should be rotated toward the middle of the abdomen until a white line is observed on the posterior lateral wall of the abdomen, which is the line of fusion of the colonic peritoneum with the parietal peritoneum after rotation of the ascending colon has been completed. This is also the attachment of the pericolic membrane to the parietal peritoneum, and is the strongest line of attachment of this *ligament;* it should be divided along this line. This will give the greatest amount of motility and require the least amount of peritonization.

Wherever the membranes of the type under discussion are situated, if tension be made on the attached hollow viscus in a direction continuous with the course of the blood-vessels and fibers of the membrane, a white line will always be observed; this is the ligamentary attachment of the membrane to the parietal peritoneum, or to the peritoneal investment of a solid viscus.

In our citizenship, made up of a heterogeneous mixture, with "no thought for the morrow," like does not produce like in a possible totality. Sprouts, buds and offshoots appear in all grades of potentiality. Many more bodies are examined *in vivo* than in the deadhouse, giving better opportunities for comparison of the types of frequency of variations from supposed anatomic standards. The accumulating evidence offered by the study of the pathology of the living will make great strides in the recognition of normal anatomy before the end results of disease have obscured it.

I would like particularly to ask discussion on the following points:

1. If the Jonnesco-Jackson-Reid membranes are congenital, are they always more or less clearly demonstrable in every individual, should the incision admit?
2. Are the membranes purposive? If so, are they not intended by Nature as ligamentary supports—preventive of intestinal stasis rather than causative?
3. Therefore they should be divided only after they have become restrictive of intestinal function, from loss of nervous and muscular tone resulting from chronic intestinal toxemia.
4. Is the method of demonstrating the white line always reliable? If so, does not this in itself prove the congenital origin of the membrane and its physiologic importance?

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. EASTMAN AND SUMMERS

Dr. M. L. Harris, Chicago: For some time past I have been operating on a large percentage of my patients under nerve-blocking by means of some combination of novocain. Without going into a discussion of the advantages of local anesthesia over general anesthesia, I wish to call attention to the great advantage which local anesthesia has in affording opportunities in abdominal operations to demonstrate the origin of many symptoms which we have learned to recognize clinically, but which we have not always referred to the proper cause. After blocking the nerves of the abdominal wall and opening the abdomen, we may then reproduce, by a variety of procedures and manipulations, characteristic pains and thereby learn positively the cause of the particular pain in question. In operating in the region of the appendix it is easy to demonstrate that the appendix is insensible to any form of mechanical manipulation or injury. It may be crushed, incised amputated or cauterized and the patient gives no evidence of pain; but traction on the mesentery of the lower end of the ileum instantly produces the characteristic epigastric or umbilical pain of which many patients with chronic appendicitis complain. In the same way we can produce the sensation of nausea, and these patients can be made to gag and even vomit by certain manipulations of the mesentery about the appendix. We can reproduce the typical pains of inflammations of the other abdominal organs in this way. This is also true in cases of pericolic membrane of whatsoever nature. We can reproduce the same characteristic, general diffuse pains of which these patients complain, not by touching the pericolic membrane itself, because that is insensible, not by manipulation or making traction on the colon, which is likewise insensible, but by making traction on the membrane itself where it is attached to the parietal wall. This is true also of the gall-bladder and the stomach. What I wish to call attention to here is that the epigastric pain, the pain or sensation of nausea and vomiting, which is present in these chronic cases, is an intestinal pain, pure and simple. It is produced by injury to the nerves going through the mesentery. The diffuse pain, the general pain, is due to interference with the parietal nerves. In circumscribed adhesions the pain may be circumscribed, but it is due to involvement of the parietal peritoneum.

Dr. H. A. Royster, Raleigh, N. C.: Inasmuch as these papers have opened up the subject of peritoneal folds, I desire to call attention to what I think is an important addition to this question. Folds and kinks, membranes and veils, are the order of the day. So far those which have received names are on the right side. We have the Jackson veil, the Lane kink, and "cobwebs in the attic," but if we go farther and follow the large intestine around, we shall find that the splenic flexure gives us some trouble, and I wish particularly to mention the "sigmoid adhesion." Nowadays we think only of right-sided pain, or we try to account for the pain by finding something wrong in the right side of the abdomen. We do not know in any given case which adhesion is going to fit until we have opened the abdomen. I think that many of us are having a great deal of trouble to explain left-sided pain, particularly in the case of women patients, because the pelvis enters into consideration. My study was directed particularly to this subject of left-sided pain in women, and, on investigation, I found that the sigmoid played a tremendous rôle in these cases. The ovary was too often blamed for the trouble. When we opened the abdomen we found a condition which we did not suspect, and, more than that, one which we did not know at first how to deal with. The etiology does not bother us nearly so much as the solution. It does not matter much whether these pains are anatomic, physiologic or pathologic. They must be dealt with if they are causing symptoms. I would suggest, however, that these conditions, if pathologic, are simply exaggerations of an embryologic or a normal condition. The symptomatology of sigmoid adhesion is a rather negative one. An important point is that the patients complain of pain on the left side during defecation. They are more or less constipated, the constipation alternating with a mucous diarrhea in some cases. In women the question of pelvic pain enters largely into the consideration of the case, with or without the sigmoid adhesion. I have ready for publication a short paper dealing with this question and the methods of handling these adhesions. I first described it four years ago. It is merely a matter of cutting the adhesion across and then suturing in a longitudinal direction. This draws the sigmoid away from its abnormal or exaggerated normal position. This may explain many conditions on the right side; I have seen a distended large bowel due entirely to sigmoid adhesion, while lesions on the right side were not present. If you are considering these intestinal folds, look on the left side and you will find a distinct clinical entity which must be relieved.

Dr. A. A. Law, Minneapolis: I do not agree with Dr. Royster that we can ignore the etiology of membranous pericolitis. As scientific men we should investigate the etiology and attempt to solve it. It is a pity that we cannot all agree with Dr. Eastman's theories. I do not presume to advocate any one theory. We must give all the theories cognizance. If the embryonic theory is correct, why do we not find these membranes in children? I have never seen membranous pericolitis in a child. My youngest patient, and I reported thirty-one cases, was 18 years of age. This is significant, for it would seem that, with the large amount of abdominal surgery being done on children for other conditions, some observer would report finding membranous pericolitis. It is only after a mass of evidence has been presented and sifted that we shall be able to arrive at a definite conclusion. I have reported thirty-one cases of this pseudoperitoneal membrane and in every one roentgenographic studies were made after the ingestion of bismuth emulsion by mouth or its injection into the colon. This number of cases is, of course, too small to be of much value, but some of the points learned from the study are valuable. In every one of the cases there was cecal atony and ptosis. In every one the cecum was in the pelvis. If cecum mobile was not present at the time of operation, it was created when these membranous bands were released. Whether this is of significance, whether this ptosis of the cecum antedated the formation of the membrane or not, I do not know. In every instance except one, gall-stones or appendicitis was present. This would seem to confirm Gerster's and Pilcher's contention that the condition is due to a chronic poisoning secondary to fecal stasis in the cecum, for here with the dilated, atonic intestinal wall the musculature is unable to lift its fecal load over the hill of the hepatic flexure. This theory seems to me the most tenable.

Dr. D. N. Eisendrath, Chicago: There is absolutely no question that Jackson and Eastman have both made exceedingly valuable contributions to the subject. There is a pericolic membrane. Whether this membrane is of embryologic or acquired origin is an open question. I have come more and more to the conclusion, after observing a large number of cases clinically and making dissections not only on the human fetus but also on the dog and other animals, that this fold of Jonnesco is an embryologic structure which persists throughout life and which may give rise to conditions of undoubted pathologic significance. In about seventy laparotomies I have seen that this fold of Jonnesco is *not*, as Summers says, always identical with the colic mesentery. It is a separate membrane. In one of my cases the membrane passed across from the parietal wall of the peritoneum. It had the typical spiral twist and you could put a finger under the upper end of the membrane and lift it up separately from the colic mesentery. Since then I have observed it in a large number of patients who have not complained of any symptoms. On the other hand, I have operated on patients in whom this membrane caused a complete stenosis of the ascending colon. I think that there is no question but that this membrane is present in its embryonic form in almost every individual. Some surgeons may be impressed with the idea that Jackson's membrane is always a pathologic structure and strip it off violently, leaving many bleeding points. The patient will then surely have postoperative symptoms. There are a certain number of patients with chronic appendicitis who do not recover as we would wish them to do and these patients may have a Jackson membrane (fold of Jonnesco) which has undergone pathologic changes resulting in kinks or constrictions of the colon. Jackson and Summers both emphasized the point that one should not be content with a pin-hole incision, but should make an incision large enough to permit a good view of the entire ascending colon; then no pathologic condition which may be present and which otherwise may escape notice will be missed.

Dr. J. N. Jackson, Kansas City, Mo.: I have no fixed view as to the origin of these adhesions or bands; that is a point which awaits final determination. I have been amused to hear men say that this condition is congenital and therefore does not amount to anything. Doctors do not ignore a case of congenital club-foot, but try to remove this condition. Whether or not we regard the peritoneal fold as congenital, whether or not it is this fold which Dr. Eastman described, we know that it is a membrane holding down the intestine and that the one thing to do, therefore, is to make traction on the bowel and where the line shows sever the membrane and ligate the stumps to prevent a recurrence of adhesions when healing takes place. On the other hand, if the theory of Gerster is correct, that there is primarily a colitis and that the disease begins on the inside, the membrane should be cut in the same way and stripped off, because otherwise the condition cannot be cured and there is always the possibility of reproduction of the membrane. It is evident, then, that we must deal with the factor of the reproduction of that membrane. Hall's theory was that it was not a colitis, but a condition due to the passage of toxins through the bowel, which lifted the peritoneum and resulted in the formation of this membrane. If it be due to anything that started within the bowel, we must do something more than divide the membrane. We must make a cecal fistula, do an appendicostomy, a short-circuiting operation or a transposition of the cecum into the upper rectum; even though the ileum be shifted, this material will be brought back by antiperistalsis, which should be excluded; this procedure is therefore not always effective. The cecum has no membrane ordinarily that would cause a collection of gas and a distention of the bowel, and thus produce traction of the peritoneum which produces the symptoms which I described.

Dr. J. R. Eastman, Indianapolis: I agree in the main with what Dr. Law has said. He has an erroneous impression, however, as to my conception of the origin of pericecal membranes. I never have been so bold as to contend that the discovery of these folds in the fetus alone explains the origin of the adult pericolic membrane, or of Lane's kink. These ideas are submitted as evidence and not as established and complete proof. I did present three somewhat original conceptions, however, which I think are worth remembering as we proceed further with the study of this subject. If I were asked to state as briefly as possible the causation of the pericecal membrane I should write down "the fetal folds plus x," and make the "x" quite large. We believe the fetal folds to be factors. When one sees repeatedly in the fetus the adhesions between the caput coli and the mural serosa before cecal torsion through the arc of 180 degrees has taken place, when one sees it at a later stage somewhat more developed and again at still a later stage as a broad band of serosa, one cannot resist the impression that the fold is drawn out from the mural serosa by the internal rolling of the cecum. Again, when one sees so frequently in the fetus Reid's membrane or fold passing from the terminal ileum down into the pelvis, connecting the terminal ileum with the genital gland, one cannot resist the impression that this genitomesenteric fold bears some relationship to the anomalous bands seen in the adult, to which Mr. Lane has given the name of ileopelvic bands. Another point concerns the so-called bloodless fold of Treves. It is my conception that this membrane fuses with the caput coli and that many surgeons have seen it in the adult as a thin membrane tightly fitting over the caput coli and embracing the appendix. This thin fold, from which the appendix is often shelled by surgeons, is the persisting bloodless fold of Treves. It is frequently found in the fetus and no doubt often persists and is dealt with as an affair of adhesions during operations for so-called appendicitis.

Dr. J. E. Summers, Omaha: If Dr. Royster will read a recent monograph by Gray and Anderson of Glasgow, he will find his operation nicely illustrated and described. I said in my paper that, if you did not find peritoneal membranes of the pericolic type in the upper, lower or middle quadrants of the right abdomen, you would find them on the left side. By making traction you will find the white line in every person. By pulling on the sigmoid and drawing it toward the median line of the body, you will often find this white line. Dr. Law's cases are few in number and apparently he does not do much surgery on children. If you will examine a child's abdomen you will find the membranous bands there as often as you will find them in the adult. The only trouble is that they do not produce symptoms and are therefore overlooked. They are put there for purposes of support and produce no symptoms unless they cause angulation. If you do not look for them you will not see them, but they are there nevertheless in a considerable percentage of cases.

Operations for Stones in Bladder, Prostate or Urethra.—Steiner discusses the surgery of stones in the bladder, prostate and urethra in *Folia Urologica*, 1913, vii, 471. He gives the latest theories as to the pathogenesis of these stones but concludes that it can only be really determined by biochemical study of the intramolecular structure of the complicated combinations which form them. He gives in detail the indications for the technic of lithotrity and lithotomy, recommends von Hacker's suture for the bladder and emphasizes the importance of examining the kidney function before any bladder operation. He has performed litholapaxy in thirty cases, suprapubic lithotomy in fifty-five. Of the former twenty-eight patients were cured, of the latter fifty-two. Two deaths among the latter were to be attributed to a prostatectomy performed at the same time. He has besides performed three operations for stone of the prostate and seven for stone of the urethra. Eight of these patients recovered, the two deaths being due to uremia. Altogether he has done ninety-five operations for stone of the bladder, prostate or urethra with cure in 93 per cent. of the cases.

PRENEURASTHENIC AND PREINSANE CONDITIONS *

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It is with a good deal of hesitation that I again present a subject on which I wrote two years ago. The longer I practice among the nervous and the insane, the stronger is the desire to have a hand in preventing their troubles rather than in curing them. The particular reason for this short paper is to bring out a full discussion of the question of prevention.

For a number of years when examining children I have tried to make up my mind as to what kind of adults they were to become. Results have been most disappointing in the main.

The disappointing thing was that I was not succeeding in finding, among children examined who were evidently not up to an average mental and nerve constitution, any classes or types of temperament to indicate their future neurologic or psychiatric dangers. To put it another way, after I had examined a given child, I found myself quite unable to tell the parents of that child what might be hanging over its head in the way of disease. This has been and is a woful lack. The parents knew and I knew that the child was not average. I am not now speaking of the high-grade idiot or imbecile or even of cases of much-retarded development, but of children who would pass for normal on casual observation, or who were considered as slightly queer. I lacked the knowledge which would allow me to say, "Your child has a temperament and constitution which is likely to make him insane or a neurasthenic in the future unless you understand him better and take such and such precautions." The parents had brought the child to me for expert recommendations as to their handling of it. They wanted something accurate and concise. My recommendations were diffuse because my basis for them was hazy. What I needed was a concrete notion of preneurasthenic and preinsane conditions in childhood, just as the tuberculosis expert has his clear idea of the pretuberculous habitus. No such concrete notion could be obtained from the literature at my command, so it had to be constructed. When an adult sufferer from neurasthenia or mental disease presented himself for examination, I went as far back as possible in his childhood history to determine his mental constitution and temperament before his illness asserted itself. I went to both pedagogic and pediatric literature for help.

The result has been the three loosely constructed types which I tried to delineate two years ago,[1] and to which I can add very little at present. My excuse for again presenting them is the importance of the prevention of nervous and mental disease in coming generations. They are not perfect. Perhaps there is no possibility of the general recognition of nervous and mental tendencies the same as we now detect tendencies toward tuberculosis. I want to know the opinion of the Section on this question.

There is at least one other reason for going over this ground again. There has been great activity in the matter of child hygiene among both laymen and the profession during the last few years. Men in general medicine, surgery, and eye, ear, nose and throat work have been studying along with teachers and school authorities to the end that abnormalities shall be corrected and future trouble averted. Over the world isolated specialists in neurology and psychiatry are also working. But, as a body, we are doing nothing so far as I know. Is it not time that we should officially record ourselves as trying to prevent as well as cure and relieve disease? To my way of thinking, this prevention can be based only on a better knowledge of child types—the soil on which, in later life, nervous and mental troubles develop. We must get this knowledge first and then we must pass it on to the men in general practice, to teachers, and to parents. The Section on Nervous and Mental Diseases of the American Medical Association is the logical fountain-head for this knowledge.

The three types I have begun to identify are as follows:

The Neurasthenic.—The neurasthenic adult is the logical result of a neurasthenic child or a normal child plus exhausting illness. Natural juvenile neurasthenia is clear-cut. On the physical side its symptoms are a general droopiness, poor standing balance, diminished expression of the face, and fatigue fulness or puffiness under the eyes. When arms are extended one will be held lower than the other and the thumbs will droop away from the rest of the poorly extended hands. Fingers twitch with irregular and slow motion, entirely unlike chorea, when the hands and arms are extended. An effort to stand erect causes an accentuated forward curve of the spine with a relaxed and protruding abdomen.

On the nerve side there is evidence of marked inability to accomplish, which is due to mental and not physical fatigue; an appearance of mental apathy which is not real, but is due to a queer combination of alertness with actual mental fatigue; a full appreciation of events and surroundings with a studied minimum of reactions to them, and abnormal sensibility to external impressions.

The Preemotional Type.—This type shades into and is often combined with the neurasthenic type. Children of the latter type, however, are usually well formed physically, while the preemotionals may show various physical stigmata frequently found with congenital mental disturbances.

The general distinguishing features between the emotional and the neurasthenic type are to be found in the study of the stimuli to which each type responds most readily. The young neurasthenic is seldom introspective. His stimuli are largely external. The future sufferer from mania, melancholia, hysteria, etc., responds to internal rather than external stimuli. Fear, ambition, love, hate, sorrow—all provide internal reasons for outward reactions, which at times become so prominent as to be labeled "unnatural." His existence is sthenic, not asthenic. He has a large range of interests and he keeps them all going. He is versatile and capable, intense in what he does and thinks, and vigorous in joy and sorrow.

The Predements.—These are the mental shut-ins. They are usually physically well built and admirable, while mentally "un-understood." Apparently happy and care-free, they often carry a hazy and terrifying knowledge of their own apartness from their associates. They are also characterized by a power to carry out their natural aptitudes with ordinary ability or even with brilliancy, thereby covering up defects in reasoning power which may be immense. They are not easily fatigued, not emotional in the usual way, seized by fundamental emotions and held by them because of inability to react to further stimuli; unable to correct ideas by reason and observation, unable either to understand or to explain themselves because of this flaw of intellect which makes impossible the exercise of sound judgment; consciously, uncomprehendingly handicapped.

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* Read in the Section on Nervous and Mental Diseases of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

[1] Moore, Ross: The Recognition of the Preneurasthenic and the Preinsane Condition in the Young, THE JOURNAL A. M. A., Dec. 23, 1911, p. 2079.

These are the three types. As described, the classification is very imperfect and possibly contains serious errors.

Fay Building.

ABSTRACT OF DISCUSSION

Dr. C. Eugene Riggs, St. Paul: The ultimate fact in this presentation is eugenics. Eugenics, like Banquo's ghost, "will not down." The child is the result of the forces of two ancestral strains. As one author has said, "Heritage is what we are, environment is what we have, training is what we do." Walter has described heritage as a method of reaction of the organism to the environment under which we live. The question is, Can this method of reaction be in any way modified? I believe that it can, Weismann to the contrary notwithstanding. Thompson cites the following instance: As the result of the inbreeding of two wheat plants, one subject to rust, the other immune, the hybrids were all subject to rust; but the inbreeding of these hybrids gave plants subject to rust and plants that were immune in the ratio of three to one. The surprising fact in this experiment, is this: that the plants that were immune to rust ever afterward bred true. This simply emphasizes a statement of Sir Thomas Clouston many years ago that there is an intrinsic tendency on the part of the individual to return to the normal. This tendency is not absolute, however. There is a certain class of defectives on which Nature has put her ban; I refer particularly to the feeble-minded. The nervous system makes its most rapid growth from the fourth to the seventh year. The brain of a child 7 years of age lacks but 2 ounces of the bulk and weight of the adult brain. The brain of a person 18 years of age has the full weight and bulk. Now, from birth until the child is 18 years old we have growth and development, and from 18 years to maturity, 25, we have development. In other words, before 25 we have the nervous system, like Kipling's ship, finding itself—coordinating itself, and bringing the whole organism into complete unity and harmony of action. Then again, from 12 upward we have the evolution of sex; also, somewhere about 14 we have the development of the intellectual, volitional and emotional faculties, the training of which means everything in the life of a child. Further, we know that if there is any weakness in the stock it will manifest itself during the adolescent period. It is at this time that dementia praecox and various forms of manic-depressive insanity develop. Thackeray, Goethe, John Stuart Mill, and many others, passed through a period of depression during adolescence. The important point is that if we can recognize those types which Dr. Moore has called to our attention, if we are aware of the dangers, the quicksands, in this period, can we not in some way prevent the cerebral and nervous disaster that otherwise will follow? Certainly we can in a proportion of cases.

Dr. G. H. Moody, San Antonio: We all realize the importance of recognizing early the weaknesses of children in order to anticipate what may develop later. As a general thing, however, I believe that we have a tendency to let the matter drop after our discussions are over, and consequently little has been accomplished. If Dr. Moore can continue and work out a tangible plan to be universally accepted whereby early in the life of the child certain tendencies can be recognized and placed in certain definite groups as he suggests, a great step forward will have been made. If he can keep under observation and follow them up for a few years those cases that he has been observing, he will secure some information that will be of great value and give us something more tangible in the way of classification than we have had heretofore. If by certain groupings which he has suggested we are able to know positively that a certain child belongs to a certain group, and is therefore in danger of developing neurasthenia if not properly guarded, that another will develop the insane complication, and so on, it would help us a great deal in a definite way. I think we are inclined right here to be a little too vague and indefinite in our attempt to do something for these children.

As suggested also, general practitioners should take up the subject, as well as teachers perhaps later. Much has appeared in recent literature regarding the dementia praecox type, which is simply a differentiation of types at a later age. Dr. Moore's proposition to start early in the proper training of these children is a most appropriate and practical one and will prove a valuable addition to the steps taken in handling these cases. If we will closely observe children with these tendencies we shall find that the symptoms manifested even at an early age are in many cases quite definite and readily recognized.

Dr. Philip Zenner, Cincinnati: So far as my experience goes I do not know that it would bear out Dr. Moore's ideas but, of course, we do not ordinarily have accurate knowledge of the early childhood of our patients. If further experience should bear out Dr. Moore's ideas, and we could in many cases foretell that this child will develop hysteria, this one melancholia, this one neurasthenia, and this one insanity, there is one great harm that might result from such knowledge. If, as has been suggested, we not only know, but also warn teachers and parents of the dangers that will come to that child, the child might be brought up with the knowledge that this danger is before it; and I can conceive of hardly anything worse for a child than to be brought up with the knowledge that he is in danger of and must be specially protected from neurasthenia, insanity, or the like. As I say, that is the one practical danger that might ensue from those ideas becoming more clearly outlined in our minds.

Dr. G. Wilse Robinson, Kansas City: Much can be done by the medical profession, and especially by this particular branch of the medical profession, in the direction pointed out by Dr. Moore. A great deal of good work is being done by school inspection in our cities relative to the physical condition of the children, but practically nothing is being done in the way of examining the mental condition of children in the major portion of our schools. Every city should have a laboratory in which these children could be tested and examined for the purpose of determining their mental condition. We cannot perhaps determine accurately whether the tendency is toward hysteria, melancholia, neurasthenia, or dementia praecox; but we can say that the children are atypical and can advise the parents that there are certain lines along which they can be developed properly—certain lines of study that they can safely pursue and certain lines of occupation that they can follow, while certain other lines of education and occupation they cannot follow. All education is simply the development of attentive control, and when these children develop neuroses and psychoses the cure of these conditions usually resolves itself into education of attentive control. With proper development they will become useful citizens, while improper training makes them public charges.

Dr. L. Harrison Mettler, Chicago: I should like to speak a word of caution on this important subject. The title of Dr. Moore's paper reads "Further Notes on the Preneurasthenic and Preinsane Conditions." I do not suppose any of us will question the desirability of the closest study and careful management of the distinctly pathologic types of these conditions. My suggestion is that, in our pedagogic enthusiasm, we must be careful not to go too far and regard individuals as defective who do not conform to our personal standard of normality. There is a great and serious danger of this among the mild or border-land cases. In the history of the world, the originators of ideas and the instigators of progress have been people who were regarded as being a little "off" in their day. The development of civilization and human advancement are not primarily due to the average, so-called normal, man. The latter is rather conservative and does his part in holding things steady or in preventing retrogression. To the average, normal man, so called, new ideas seem strange, erratic and abnormal. He who brings forth these new ideas is usually atypical as an adult, and may have been atypical as a child; and it is an exceedingly difficult matter at times to differentiate an individual who is atypical merely in a sociologic sense from one who is atypical in a pathologic sense. Our whole system of public education is evidence of this. Sometimes it were better to let some of these apparently atypical children develop in their own way both for their own good and the good of the world. A dull, uniform mediocrity is not the goal of the human race.

Much here depends on the ability of the examiner. As in meddlesome midwifery, so here there is more danger of too much unintelligent interference than there would be in no interference at all. It may happen that a medical examiner's standard of ability may be quite below that set by the child for itself. The art-loving child may appear to be quite peculiar to the mere card-playing doctor. Again, children are sometimes rendered neurasthenic and hysteroid by their environment and stupid parents. Though the child may here appear to be atypical, it is the environment that is atypical for the child. Someone has well said that if half of the children were dismissed from the public schools and their places taken by their parents, a great improvement would be seen in the child-life of our nation, and, I am sure, much smaller number of atypical children would be met.

Eugenics is teaching us much nowadays. The science is still in its infancy. We must not dogmatize beyond the facts in hand. We must, as individuals and as a profession, learn more what mental health means for a given child and not adopt any fast and set standard, based merely on average mediocrity. This is a large task.

Dr. W. W. Graves, St. Louis: Some one has said that in Nature there is no blind tendency toward perfection, and it seems to me that if we recognize and study types in a comparative way, eventually we shall be able to secure not only definite data by which we may recognize the tendencies of individuals and prevent disasters in their lives, but also information which may be applied in the begetting of offspring in a eugenic way. Let one go into a home for the feeble-minded, into an epileptic colony, or into an asylum for the insane if he will, and there he will meet with essentially different types of humanity from those which he meets in the common walks of life. More than that, if one studies in a comparative way the parents of the feeble-minded, of the epileptic and of the insane, and the near relative, he will often find similar types. The insane, the feeble-minded, the epileptic, are persons whose resistance to disease is inherently lowered; they are unable to adapt themselves to environment, and they succumb relatively early in life. If we can by the study of types learn to recognize what is the underlying factor in disease, if we can determine what are the factors in the life of the individual that cause him to be less resistant in the stress and strain of ordinary existence and make him peculiarly susceptible to disease, this will help solve the problem. We must soon recognize the necessity of studying human beings from the biologic point of view. The only conceivable fact underlying every function, whether it be mental, physical, or what not, is that without structure, function is not thinkable. We must therefore study human beings with the same sort of ideals that we study the plants or animals or any other living thing in Nature. While we have no such condition as normal for any living thing, we have ideals of normality, and those ideals are founded on harmony of structure, proportion of structure, and adaptation of structure to function. These factors enter into the point of view from which we should judge human beings. There is an old classical ideal, *Mens sana in corpore sano.* Persons who fulfil this ideal represent the good types of the race, types which we seldom find in insane asylums. Instead we find the abnormal types representing asymmetries, disproportion and disharmonies in development. If we study human beings as we study animals and look for the points of the ideal in their physical make-up, we shall have at once some basis for the determination of the resistances of the individual, not only to neurotic disorders, but also to disease in general.

Dr. Howell T. Pershing, Denver: We have two things to consider here. First, the general scientific facts concerning nervous children, and, second, the tremendously difficult problem of the individual nervous child. It seems to me that most of our work has to be done with the individual, and with him alone. There is a great barrier, as a rule, between the child and his elders. The height and thickness of the stone wall that sometimes separates father and son render it almost insurmountable. The average nervous child is a lonely child. He plays with his fellows, goes to school and talks with his elders, but there is much going on in his mind which he keeps to himself that would be important for his father or the doctor to know. All our conventions tend to repress self-revelation. In being educated into ordinary decency and morals, a child gets a terror of mentioning certain things. He is not going to lay bare his mind before any one, not even his father or mother. It would be a great advantage if to the proper extent we could establish communication between a wise elder—a *wise* one and not any one that happens to be in the schoolroom—and a sensitive, nervous child. With all this, we must respect the personality of the individual. There is a certain amount of reserve that ought not to be broken down. How far shall we go in getting into each individual's own mystery? And in it all we have to be exceedingly careful not to implant any morbid fears in the mind of a child. We must be careful not to give the nervous mother an idea that her child is going to be insane or even a neurasthenic, as Dr. Moore has said. This is an extremely difficult matter to deal with. I remember reading long ago a short story by Hawthorne which ended tragically, and, as I recall, the last sentence read something like this: "He had taken the delicate soul of a woman into his rude hands and crushed it." It is easy to take the delicate soul of a child into rude hands and crush it. It is easy to instill into the mind of a child ideas which will act as a veritable poison, and yet there may be ideas already acting as a poison which could be removed if the right person knew of them. So I try to encourage my youthful patients to feel that it is proper and safe to tell me of anything that troubles them in order that I may be able to help them. It is, however, a difficult matter at best.

Dr. C. B. Woodson, St. Joseph, Mo.: Children of the types under discussion should be dealt with not unlike others. To point out that a child is nervous, sending a note to mother or teacher to this effect with suggestions as to care, etc., is simply being meddlesome. The matter should be presented systematically to the parent; it is not necessary to say to the parent that the child will not develop into a strong individual mentally. The important thing for any child is to have good sanitary surroundings, proper nourishment, and a reasonable amount of exercise and play. All children should be taught the importance of bearing disappointment well. If the child goes into a rage because it cannot do the thing it wants to do, it makes no difference whether the condition is one of prenervousness or not, it gets the better of that child. Study along lines of special aptitude is perhaps one of the worst things that can be carried out, either in the case of a nervous person or one who is not nervous.

There is no reason why the offspring of a person suffering from a pronounced neurotic taint or history should become insane or be particularly nervous, if the right lines of education are followed out; but the individual who has this tendency or predisposition should not go into a business that would carry with it, for him, a hazard, for this would be sure to cause the development of depression and anxiety. He should be kept on safe ground. When we come to overloading, however, it matters not who it is, I maintain that when the load passes beyond the resisting capacity we can put on enough to crush the individual. Load the horse, the bridge, the wagon, the elevator, beyond resisting capacity, and the structure must be relieved or there will be a catastrophe. The best thing to do in these cases is to establish close relationship of the parent if he is normal. If the parent is not normal it is better not to have this companionship. If the parent is so easily startled that the child tends to become timid, this makes the child nervous. If the parent is overexacting this makes the child nervous, although the parent is unconscious of it.

A liberal education regarding matters in general, in school, in business, in dealing with associates, etc., should be maintained as much as possible, and to overcome defects in the child it is highly important for the teacher to cooperate with the doctor to this end.

Dr. Ross Moore, Los Angeles: The men in general medicine, or those making a special study of tuberculosis, are in a position to say that such and such things really constitute a habitus which predisposes a child to tuberculosis in the future. They can make a clear word-picture of this habitus. Their discussion would not have gone far afield, because there are certain definite ideas in their minds as to what constitutes a pretuberculous condition. A parallel to this is the gist of what it was my desire to bring before you in this paper. Instead of that, we have in the discussion reached a number of different points of view. The discussion indicates the state of mind which is present among neurologists and psychiatrists on the question of preneurasthenic and preinsane conditions. I am inclined to believe that the types which I have tried to delineate are inaccurate. They must be, because they are based on too small evidence. And yet the discussion has been sufficient to make me believe that something along this line might be done if we all went at it in the right way. The subject is a good deal wider than the paper. I wish not only to recognize these things to prevent disease in the future, but also to widen out the question of eugenics to the end that people who are peculiar in these ways will learn not to marry, or, at least, not to have children.

Nature would be a good mother, it is true, if only Nature could have the chance. In these days, however, Nature is so badly modified by what we call civilization, that we neurologists and psychiatrists really have a big field in which to help this good old mother. Interference, of course, which creates panic in the hearts and minds of parents is wrong. If, however—the doctor knows absolutely before he says anything to the parents at all that a child ought to go along such and such a line in his future development—then he has a basis in his own mind for a wise, just, kind, and thoroughly helpful recommendation to the parents.

Most of the adverse discussion which we have had here more or less revolves around the idea of our not doing the right thing by these children and by the parents. The reason that we cannot do it is simply that we have not the basis for it. Yesterday we found distributed here a notice from Buffalo inviting all the world to attend a meeting there in August which will deal with the welfare and instruction of children. A few days before I left home communication came to me through the mails giving the names of men all over the world who are particularly interested in this movement toward child hygiene. I was sorry to find few neurologists and psychiatrists among the number.

Compulsory Cleansing of Milk Receptacles.—According to the April *Bulletin of the Indiana State Board of Health*, a law was enacted by the last legislature of that state requiring the cleansing of milk-cans, bottles, etc., immediately after the removal of the milk therefrom. A similar law enacted in New York was upheld by the Supreme Court of the state, after being attacked on constitutional grounds. The court held that on account of the danger to be apprehended from the use of unclean receptacles for milk intended for human food, drastic measures to prevent the possibility of such use are reasonable and justified, and that it is clearly within the police power of the state to require dealers to wash bottles before they are refilled. With this precedent the Indiana law will probably not be attacked on constitutional grounds. It is a proper and reasonable regulation.

TEACHER AND LEARNER IN MEDICINE*

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We are to-day in the midst of a great unrest in American medical education, and the movement for a true teaching spirit in medicine is now irresistible. How shall we meet it, how help it on its course? I propose to assemble what seem to be the chief factors in our problem as teachers and learners, setting aside formal administrative questions, and dealing largely with the more personal and fundamental. Let us try, on the threshold of a new year of work, to catch this true spirit, in order that it may permeate all our coming endeavors.

In reviewing the experience of a student of twenty, fifteen, or even ten years ago, one is forced to wonder that medical teaching has lagged so far behind medical knowledge. When Vesalius struck down the centuries-old authority of Galen, and made anatomy a fabric of thought and action, he surely laid therewith the foundation of an effective mode of teaching and learning medicine. But such it was not to continue. Medicine germinated, and blossomed finally with Pasteur into a science. Medical teaching meanwhile wrapped itself in its medieval cloak, and for generations the student sat passive in the lecture room while the professor droned.

THE LECTURE AND PASSIVE RECEPTIVITY

The lecture method may in fact be used to furnish the key to the situation. We learn to see by seeing; to think, by thinking; to do, by doing. The plan in the old-time medical school was briefly this: the professor, having in the richness of his experience seen, thought and done, appeared before his students and told them things, often interesting, sometimes not. It was this passive reception of information about the work of others that gave validity to the student's degree. Yet not for a moment was it conceded that the lectures prepared the student to practice medicine. The student learned to practice medicine by *practice* in the old days, under the supervision of some one experienced physician; in later years, in the laboratory and clinic. All this has now become so clearly seen that we must accept the conclusion of Le Count[1] that "a medical school should be a place where medicine is practiced by students instead of a place where students prepare to practice." "These things," he says again, "are learned not by the telling but by the doing."

We do not need to confine ourselves to writers on medical education to find expression of the principles that should guide us. Reform is wide-spread, and some of the most telling and acceptable criticisms for us that I have met are from university and college teachers of other subjects. Nothing could come more directly home to us than the following comments of Alexander Smith[2] in connection with chemistry teaching:

> The lecture places the student in a passive and receptive attitude. Yet it is not the reception, but the reproduction of an idea that fixes it on the memory. The hearing of a story makes no permanent impression. It is only after we have retold the story that it suddenly leaps into a permanent position in our repertoire. The first hearing of an idea pro-

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* Opening address before the Medical Department, University of Buffalo, Sept. 23, 1912.

[1] Le Count: An Experiment in Medical Pedagogy, Science, 1910, xxxii, 942.

[2] Smith, Alexander: The Rehabilitation of the American College, and the Place of Chemistry in It, Science, 1909, xxx, 457

> duces but a faint track in the brain. It is the putting together of this idea, in its original setting, and also along with new ideas, that converts the first faint track into a traveled road. Is it not one of the strong points of language study that the student must put together in an endless variety of forms, the limited number of ideas he is trying to master, and must do this by his own efforts? . . . If we had attempted to devise some method which should run contrary to all conditions for successful undergraduate instruction, we could hardly have invented a scheme which would be more certain to fail than that I am discussing. The main point is that we learn only by our own efforts, and not by watching the efforts of others. Some one has said that the college is a "gymnasium where the faculties of men are exercised and developed, rather than a boarding-house where the students are crammed with facts." We develop physical muscle by exercise. Is there any other way of developing mental fiber? Can we ever cause mental fiber to *develop* by dealing out ready-made ideas? It is a psychologically impossible process. . . . Let us beware of a method of instruction in which the facts are found, not by the student, but by the professor; in which they are arranged and related, again by the professor; in which the conclusions are drawn, by the professor; and the conclusions are finally tested, not by the student, but by the instructor.

I was interested some years ago in noting the student's attitude toward medical lecture courses, and found that the student, with his usual ingenuity, had devised various means of circumventing an admittedly useless demand on his time and patience. Of course, the problem was to pass the examination. There were various ways of doing it. Only one of these ways was to attend lectures and use one's own notes. Printed notes could be bought, often better than one's own. Notes could be borrowed. A "quiz-class" could be attended, where direct contact with a tutor lent a certain real value to the instruction. Rarely were accredited textbooks employed, though the miserly but handy "compend" often did its share. The men passed, often well. Some got highest marks without even knowing the instructor by sight. Passing in itself had become a finely specialized art. In a discussion of the lecture method undertaken at that time[3] I wrote as follows:

> A system which thus encourages the art of passing must create for the student the delusion of a royal road. Moreover, the austerity of the informative lecture is not the austerity which develops effort, but is rather indulgence cloaked with severity; and the result is a form of parasitism. Lectures covering a subject in detail are the outcome of extended study and compilation on the part of the instructor; he gathers, systematizes and places at the disposal of his students what he thinks they need to know. It is food elaborated by professorial industry, found all-sufficient by the student and taken exclusively as a matter of economy. The student parasite adapts himself readily to this predigested diet: organs of independent acquisition disappear, being useless, while organs for appropriating the elaborated food develop prodigiously; and the process is consummated in the complete acquirement of the art of passing. No matter how much hard, self-denying work is done on material obtained wholly from lectures, the weakness remains. The student comes to regard the lecture as the source of all knowledge; and the apparent all-sufficiency of lecture information, emphasized by examination, deters him from independent effort. By avoiding certain subjects a student may complete a college career almost without once entering the library. He has never learned even the meaning of original sources and is consequently devoid of the power which their use alone can impart. As a lecture parasite he thrives as long as lectures thrive, and at the end has earned his merited reward—a surfeit of information; but the faculty whereby alone information is of any worth is rudimentary or wanting. Students taught chiefly by lecture become effectively trained in but one subject—the passing of examinations. As Huxley said, "They work to pass, not to know; and outraged Science takes her revenge. They do pass, and they don't know."

What Huxley[4] said in 1874 could be said in this country of most of our best medical schools in 1900, and is still true of any institution at which the student is fed, as Osborn[5] has expressed it, on "mental peptones." "The measure of a teacher's success," he remarks, "is the degree in which ideas come not from him, but from his pupils," thus summing up the main contention of his master, Huxley.

Let us not make the mistake of condemning the lecture because it has given us ill return for the sort of use we have made of it. It is not lectures *per se* that we must abolish, but a certain educational fallacy, already indicated, to which the lecture method has proved the easiest prey. Knowledge that is power cannot be gained by passive, sponge-like receptivity.

"Knowledge by suffering entereth." Knowledge is a strife. Hence the motto of our new teaching is one entirely inconsistent with merely informative instruction. It is well put by Jackson[6] in these words:

> Never tell a student anything he can observe for himself; never draw a conclusion or solve a problem which he can be led to reason out for himself, and never do anything for him that he can do for himself.

CHARACTERISTICS OF GOOD TEACHING

The legitimate uses of the lecture are many and valuable. Get the student to seeing, thinking and doing for himself, and you have in the lecture-room a rare opportunity to give direction and unity to his work, and to impart stimulus—perhaps inspiration. The lecture, relieved of its undeserved incubus, takes its place as a useful adjunct.

Let it be remembered that there is not a single method of teaching that we can employ into which the fallacy of passive receptivity cannot in one form or another find entrance. If laboratory experiments are followed by rule of thumb—mere tasks for the hand and the note-book; if dissections are made as perfunctory demonstrations of memorized pages of anatomy; if the clinic is "attended" merely, instead of being *used;* if treatments are prescribed as inevitable sequences to given diagnoses—if any or all of our vaunted methods of "practical" instruction lack that reasoning, problem-solving strife for knowledge that alone begets the faculty to do, to do well, and to win—we are still harboring the insidious infection that we sought to exterminate when we burned or otherwise sterilized the lecture system. I once overheard one student ask another, in one of the best courses in pathologic histology given at that time in this country, "What are we required to see?" That student expressed in six words all the blindness of the middle ages and the arch-heresy of modern science. If a student has ever looked into his microscope and wondered what he was "required to see," let us hope that he may have changed his mental attitude when, as physician, he looks into his patient's throat.

This case is paralleled by one cited several years ago by A. A. Noyes of the Massachusetts Institute of Technology in his admirable "Talk on Teaching."[7] The student came to his instructor "with the complaint that he couldn't do his problems because each one was different from the others." I am glad that he was not a medical student. "The good teacher is constantly trying to lead the student on," says Noyes, "but he refuses to carry him."

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[3] Pratt, F. H.: The Dangers and the Uses of the Lecture, Educational Rev., 1902, xxiv, 484.

[4] Huxley: Universities: Actual and Ideal; in Science and Education, Essays.

[5] Osborn: Huxley on Education, Science, 1910, xxxii, 569.

[6] Jackson: The Improvement of Medical Teaching, Science, 1910, xxxv, 566.

[7] Noyes: Science, 1908, xxvii, 657.

F. S. Lee[8] takes exception thus to a recently published laboratory manual of physiology:

> The most striking feature of the book is the elaborateness of the directions for laboratory work, *something with which we in America are not familiar.* The student is never left to determine a procedure for himself, but is told exactly how to do the thing desired. He must, for example, hold his scalpel thus and so, the verbal instructions being supplemented by a nearly life-sized picture of a hand holding the instrument. . . . In order to tell how to make a frog's muscle-nerve preparation two pages of text are required and two additional pages of life-sized illustrations.

Lee concludes his review with the following quotation from one of the Carnegie reports:

> *If, then, physiology is to be taught as an experimental science, as a science of function, the student must be allowed to run risks, to calculate, to observe, to verify, to conclude. Eliminate risk and the experiment becomes a mechanical toy: may amuse, it does not discipline.*

have referred to "A Talk on Teaching" by a professor of chemistry.[7] It is full of valuable advice, directly applicable to our own teaching problems. Of somewhat broader scope is George Herbert Palmer's "Ideal Teacher." Palmer[9] has outlined in a fundamental, simple way his conception of the good teacher. What most concerns us, I think, is this: The prime, imperative condition to be fulfilled by the good teacher —in fact, by any one worthy to be called teacher—is that he love to teach. Here is a passage worth much quoting:

> Harvard College pays me for doing what I would gladly pay it for allowing me to do. No professional man, then, thinks of giving according to measure. Once engaged, he gives his best, gives his personal interest, himself. His heart is in his work, and for this no equivalent is possible: what is accepted is in the nature of a fee, gratuity, or consideration, which enables him who receives it to maintain a certain expected mode of life. The real payment is in the work itself, this and the chance to join with other members of the profession in guiding and enlarging the sphere of its activities.

I am convinced that, no matter how important methods and policies may be in our medical teaching, a rich source of our failure lies in the assumption of instruction by those who do not in their hearts love to teach. A man may be an atrocious lecturer; he may be slow, awkward, outwardly uninteresting. If he loves his subject well enough to know it, and in addition loves to impart it, somehow he can kindle the student and get work out of him when the more facile man fails.

EXTERNALS AND INTERNALS

Just as the externals of manner and method count but little beside the spirit and motive within the man, so do the externals of housing, equipment and appropriation fall more than into second place when we consider the man and his subject. Some one asked an eminent teacher what he would regard as requisite in order to establish in a certain institution a department of psychology. His reply was to the effect that, first, a *psychologist* was necessary, and then, if one wished, there might be provided some bits of colored paper—though the latter were comparatively unessential. "We put our trust too much in systems and not enough in persons," says our authority on botanical teaching, William Francis Ganong.[10]

> And for this there are many evidences. For one thing we rely too much on a supposed virtue in buildings and equipment, though in this we but share the spirit of our machinery-mad day and generation. It is much easier for us Americans to obtain great laboratories and fine equipment than to make good use of them afterward, and nowhere among us do I see any signs of a Spartan pride in attaining great results with a meager equipment. Moreover, we make a deficiency of equipment an excuse for doing nothing. As one of the most brilliant of American botanists once said, some persons think they can do nothing in the laboratory unless provided with an array of staining fluids which would make the rainbow blush for its poverty.

Given teachers who love their subject and take joy in teaching it, who know their subject so that they can give lavishly, who can so interpret the mind of the student that the subject may incorporate itself effectively in relation to other subjects, and who insist on learning by doing, and doing well—and what matters it if the rooms be dingy and the bottles cracked?

For the student, too, externals count for little. Says David Starr Jordan:[11]

> The man, the teacher and the contact with Nature—these are the only realities . . . The university cannot make the man . . . its principal influence is found in the degree to which it grants the inspiration of personality.

The student entering his professional course should remember this: "The university cannot make the man." It can put nothing into him that is not already there in some form. It is for him to see that what *is* there receives exercise and development. It is he who does the work. If he has in him a living desire to make the most of his opportunities, a liberal education in the best sense awaits him. "Any study is liberal," in the words of Tufts,[12] "if pursued in a scientific manner and given significance for human life. Such studies call out a widening self. In such studies the mind comes to its own. In such it gains power." "Medicine," he adds, "is perhaps the farthest advanced of the professions in this respect." This judgment, coming from a non-medical educator, is for us significant.

AIMS FOR THE STUDENT

The student must not be content to follow solely the path marked out for him in his course. He must enrich his mind, while it is yet plastic, with general reading that is good, if ever so little. No one needs broad interests more than does the physician. He may have to fight hard to get these things, but they are worth the fighting. "Without idealism of purpose," said Christian A. Herter,[13] "without the willingness to make sacrifices of material comfort and much that the world overprizes, the career of the student and practitioner of medicine is almost certain to be pitifully limited and mediocre."

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[8] Lee, F. S.: Science, 1912, xxxvi, 375.

[9] Palmer, G. H.: The Ideal Teacher, Atlantic Monthly, 1907, xcix, 433.

[10] Ganong, W. F.: Some Reflections on Botanical Teaching in America, Science, 1910, xxxi, 321.

[11] Jordan, David Starr: *The Making of a Darwin*, Science, 1910, xxxii, 929.

[12] Tufts: American College Education and Life, Science, 1909, xxix, 407.

[13] Herter, C. A.: Imagination and Idealism in the Medical Sciences, The Journal A. M. A., Feb. 5, 1910, p. 423.

The possession of keen, responsive senses is a priceless asset to the physician, and this will depend not only on his general bodily health, but also on such foresight and sacrifice as are necessary to maintain a life of self-control. "The careful preservation of the senses in the freshness of their perfection," wrote Philip Gilbert Hamerton,[14] is altogether incompatible with every species of excess."

> If you are to see clearly all your life, you must not sacrifice eyesight by overstraining it; and the same law of moderation is the condition of preserving every other faculty. I want you to know the exquisite taste of common dry bread; to enjoy the perfume of a larch wood at a distance; to feel delight when a sea-wave dashes over you. I want your eye to be so sensitive that it shall discern the faintest tones of a gray cloud, and yet so strong that it shall bear to gaze on a white one in the dazzling glory of sunshine. I would have your hearing sharp enough to detect the music of the spheres, if it were but audible, and yet your nervous system robust enough to endure the shock of the guns on an ironclad. To have and keep these powers we need a firmness of self-government that is rare.

Two qualities I would urge the student to cultivate in relation to his work. They are patience and loyalty. Often he will feel disposed to grumble because he cannot see why such and such a subject is dragged into a medical course, or why he need learn the details of a yet unsettled problem in science. Let him have patience, remembering that subjects possessing apparently a very indirect bearing on practical medicine have been and always may be of deepest significance. The judicial mind is one of the highest possessions of the physician; and loyalty, of the friend and gentleman.

WORK OF THE PHYSICIAN

It is an oft-repeated truism that the doctor should be what his name implies. Yet it cannot be too earnestly reiterated. Few men are called on to teach more things than is the doctor. His influence over the community is enormous. He must train himself to render service wherever possible in teaching people to live sanely.

He must also teach them to *think* sanely. The public mind is wofully ignorant of what medical science is, and of what it has done and can do for humanity. Swayed hither and thither by charlatans, agitators and an undiscriminating press, the public instinctively seeks the doctor as the one fitted to expound the sober truth and point out where authority really lies. He cannot begin too soon to practice the weighing of scientific evidence, in order that he may spread the new gospel in medicine—that demonstrated facts, not philosophies and schools of opinion, are now in medicine, as they have long been in the natural sciences, the sole basis of practical application. Through such endeavor alone, which I hold to be the very highest that can claim the attention of the physician, can come that movement for public sanity characterized by President Eliot[15] as a "new Declaration of Independence," which, he says, "would exhort the people to spend more money on public education, so that the new generations may become quick to detect error, to accept facts and to discriminate between the plausible and the sound, the probable and the improbable, the credible and the incredible, the guesses of a roving imagination and the results of actual experiment." Lee[16] has called the physician who is also a good citizen "a missionary of common sense."

THE MAN OF SCIENCE

What an overworked, distorted expression "scientific" is in every-day life! It has received such advertisement for commercial and sensational ends that we cannot speak of science without suggesting a sort of wizardry, through which astonishing discoveries occasionally emerge from absent-minded, cold-blooded, impractical gentlemen in laboratories, whose time is mainly spent in satisfying a prying curiosity. From the time of Galileo to this day it has been the lot of science to be misinterpreted and misunderstood. It does not take the medical student long to begin to see how utterly medicine draws its sustenance from abstract science; and who shall bring the public into helpful, sympathetic relation with the scientific investigator but the physician, who owes his hourly skill to the truth-seeking labors of Harvey, Bernard, Helmholtz and Pasteur? The work of science is simply *an attempt to arrive at truth through honest observation and straight thinking*. And it is the duty and privilege of the physician to proclaim it as such; for, in the noble words of Huxley's autobiography,[17] "there is no alleviation for the sufferings of mankind except veracity of thought and action."

Beyond and above every triumph of applied science that brings a boon to humanity there hovers a great cloud of witnesses—names known and illustrious, names unknown or forgotten in the theoretical, "impractical" realms of learning—to whose labors the final inventor or discoverer has added his final straw of genius. We must teach the people to reverence such names as they are reverenced, for example, in France and Germany. When the French people voted to see who was considered their greatest man, it was not Napoleon who was chosen, but Pasteur, whose unspeakable service had won their love and gratitude. To this end every medical man should be a reader of scientific biography. The final triumph of truth attained is dramatic and inspiring; the path of action marked out thereby, clear and satisfying. Thus in the midst of his baffling problems the physician can take heart, and likewise help others to take heart, in the thought that life-giving knowledge is replacing, little by little, the ignorance of the ages.

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[14] Hamerton, P. G.: The Intellectual Life, Letter 7.

[15] Eliot, Charles W.: Faneuil Hall Address, July 4, 1911.

[16] Lee, F. S.: A Defence of Sanity, Science, 1909, xxx, 823

[17] Huxley: Method and Results, Essays.

Duration of Infectiousness of Secretions in Epidemic Poliomyelitis.—Kling, Wernstedt and Pettersson state that in a series of nine cases of typical infantile paralysis the secretions from the mouth and intestines were obtained by lavage, and monkeys were inoculated with them after various intervals. In their communication on the subject in the *Zeitschrift für Immunitätsforschung*, 1913, xvi, 17, tables are given showing the results obtained at periods varying from one week up to seven months. Almost all the monkeys inoculated in the first few weeks died; only one died after a lapse of seven months. In only one case were the secretions harmless as early as by the end of the first month. However there was a steady decrease in the degree of virulence manifested. Inflammatory exudate in the spinal cord was found only in cases inoculated during the first two or three weeks. After that the chief change was degeneration of the nerve cells, showing diminished virulence of the toxin. It would manifestly be impossible to isolate patients for the several months during which the secretions are infectious, but if they are isolated during the first few weeks of greatest virulence the disease will appear only in the milder or abortive forms.

THE CLINICAL AND PATHOLOGIC RELATIONSHIPS OF HYPERPLASTIC AND NON-HYPERPLASTIC GOITER *

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The study of the clinical and pathologic relationships of the various types of goiter has of necessity been followed with the greatest interest in the surgical clinics. In a short paper it is impossible to review the various contributions to the subject. The following points, however, may be selected from the work done in these clinics: the clinical classification of the cases of goiter into simple or exophthalmic or equivalent terms, and the pathologic classification of the thyroids removed at operation into those with and those without sufficient hyperplastic or hypertrophic changes to characterize the gland; the recognition of toxic-goiter heart in a certain percentage of cases that are not diagnosed exophthalmic goiter and a less generally well-defined idea that the cardiac damage is only one of the manifestations of a general toxicosis; the finding of hyperplastic changes in from 70 to 90 per cent. of the thyroids removed for exophthalmic goiter, and the occasional presence of hyperplasia in glands removed from patients not having a history of notable toxic symptoms. Wilson, in 1908, after reviewing the available pathologic material from the cases which had been diagnosed as exophthalmic goiter, and in which operation had been done at St. Mary's Hospital, pointed out that 80 per cent. of the glands showed hyperplastic changes, and that, in general, the length and severity of the case history could be determined from the pathologic findings.

The relative constancy of notable hyperplasia in the thyroids of fully developed exophthalmic goiter, contrasted with the occasional failure to find this pathologic condition in glands removed from patients having an apparently similar clinical picture of this disease, and the rare finding of diffuse hyperplasia without accompanying evidence of thyrotoxicosis has led to much discussion and conflicting opinion regarding the specificity of this change.

In the latter part of 1908 a review of the clinical histories and the pathologic reports of our entire series listed as simple and exophthalmic goiters led me to the following conclusions: 1. We have at least two distinct, but very similar, types of thyroid intoxication, one associated with non-hyperplastic goiter, the other associated with hyperplastic or hypertrophic thyroids. 2. All cases having thyrotoxic symptoms with notable hyperplastic thyroids should be diagnosed exophthalmic goiter and that cases having thyrotoxic symptoms without notable hyperplastic thyroids should be classified with the cases of toxic-goiter heart, at least until we have still further evidence on which to subdivide these groups.

The main objection to these conclusions was the inability to make the clinical and pathologic diagnoses agree in about 10 per cent. of the cases. The lack of constancy in the clinical and pathologic relationship in mild and atypical cases could be easily explained. Our series, however, included (and I think this was true in other clinics) a number of cases of apparently typical exophthalmic goiter with exophthalmos and a pathologic report of adenoma, colloid goiter, adenomatosis, etc., without hyperplasia. A careful study of these cases demonstrated errors either in noting the presence of exophthalmos or from incomplete pathologic examination in the majority of instances and a probability of errors in the remaining portion.

This led to the use, in writing the histories of the 3,207 cases that have come to operation since Jan. 1, 1909, of forms covering in great detail the points which might later prove of use in studying the development and course of thyrotoxicosis and its relation to the pathologic changes in the thyroid. Figures and signs having, so far as possible, fixed values have been used in place of descriptive adjectives. Observations of fact and opinion have been carefully distinguished. The clinical and pathologic findings have been placed in parallel columns without any comparison of notes on the part of the clinicians and the pathologists. Clinical records for statistical purposes have not been changed after the patient came to operation. This has made possible the compilation of statistics by clerks who are not in any way warped by preconceived ideas or a knowledge of factors other than those under immediate consideration.

Correlating the statistical data, we may safely come to the conclusion that exophthalmic goiter is a definite clinical complex always associated with hyperplasia of the thyroid, and that it should be sharply distinguished from the constitutional state or states that may develop with non-hyperplastic goiter. As a complete review of this material is beyond the scope of a short paper and the patience of the average reader, I have attempted to answer the questions brought up with the least possible amount of statistical data, using only the following factors: the age at which the goiter is first noticed by the patient; the age at which thyrotoxic symptoms developed; the presence or absence of exophthalmos, and the presence or absence of notable hyperplasia in the thyroid. It is my purpose to take up these questions with a full report in a series of papers.

The term "thyrotoxicosis" is here applied to the constitutional state associated with goiter. As a matter of convenience for quickly presenting the association of the clinical and pathologic findings, the constitutional symptoms accompanying goiter have been attributed to a toxemia the result of a disturbed thyroid function. As a temporary expedient the cases have been classified pathologically as hyperplastic and non-hyperplastic, and clinically as hyperplastic-toxic, hyperplastic-atoxic, non-hyperplastic-toxic and non-hyperplastic-atoxic. The glands showing marked hypertrophy have been included with the hyperplastic goiters. Following this classification for the 2,917 new cases coming to operation between Jan. 1, 1909 and Jan. 1, 1913, 42.8 per cent. are hyperplastic and 57.2 per cent. are non-hyperplastic. Of the hyperplastics 99.2 per cent. are toxic and 0.8 per cent. are atoxic. Of the non-hyperplastics 23.3 per cent. are toxic and 76.7 per cent. are atoxic.

While the association of the constitutional symptoms with non-hyperplastic goiter involves to a certain extent a personal equation, this is to a very limited degree true for the cases having hyperplastic thyroids. The estimation that 23. 3 per cent. of the non-hyperplastic goiters are toxic is made on a very conservative basis.

Patients coming under observation with non-hyperplastic-toxic goiter give a history of having first noted the goiter at the average age of 22 years, and the evidence of intoxication at the average age of 36.5 years. The corresponding ages for hyperplastic goiter are, respectively, 32 and 32.9 years.

That non-hyperplastic goiter is noted ten years earlier in life than hyperplastic goiter, that fourteen and one-half years elapse between the appearance of non-hyper-

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* Read in the Section on Practice of Medicine of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

plastic goiter and the development of notable toxic symptoms, and that the constitutional symptoms were noted but a few months (between ten and eleven) later than the goiter in the patients affected with hyperplastic thyroid is alone sufficient to show that we are dealing with at least two distinct pathologic and clinical groups. That one is not the sequence of the other is self-evident.

Are all hyperplastic goiters coming to operation toxic? Throughout our series the number of cases in which the clinician failed definitely to note and attribute constitutional symptoms to the thyroid and which were later diagnosed hyperplastic goiter by the pathologists vary from two cases in 1909 to four cases in 1912. Two of these latter four cases were in children under 4 years of age and can be excluded in considering the hyperplasia of adults. The third case was that of a girl 15 years of age who gave a history of having noticed the goiter, periods of tremor, tachycardia and palpitation for nine months. These symptoms, however, were not attributed to the thyroid previous to operation. The fourth case was that of a woman 47 years of age who gave a history of having noticed the goiter for twelve years, rapid growth during the few months previous to coming to operation and a long train of symptoms, part of which might be attributed to thyroid intoxication. I have excluded a few cases that had small areas of hyperplasia in the thyroid because they are still under discussion by the pathologists. The majority of them had moderate toxic symptoms indicating that the activity of the thyroid is proportionate to the degree of the hyperplasia.

Is hyperplasia of the thyroid more prevalent in the first two decades of life than we have definite knowledge of, perhaps indicating a thyroid activity in response to some demand that cannot be considered far from normal? If so, is this hyperplasia of the thyroid to be sharply distinguished from the hyperplasia associated with exophthalmic goiter which develops at the average age of 32? I do not think that we can definitely answer these questions at present, though there is much evidence suggesting an affirmative answer, at least to the clinical side of the question.

Is the exophthalmos of thyrotoxicosis always associated with hyperplastic goiter? The pathologic reports fail to show the presence of hyperplasia in the cases in which exophthalmos was noted by the clinician, six times in 1909, four times in 1910, twice in 1911, and not in a single instance in 1912. Nine hundred and eleven new cases of goiter came to operation in 1912. In most of the exceptions to the rule previous to 1912, we have been able definitely to prove that there was an error in noting the presence of exophthalmos.

Should all toxic-hyperplastic goiters be included under the term "exophthalmic goiter"? Possibly there is a small group of cases which should not. That there is very little chance for error, however, in answering this question in the affirmative if we include only those cases coming to operation is indicated by the following facts: (1) Of the cases having diffuse hyperplasia of the thyroid coming to observation from one to three, three to six, six to nine, nine to twelve, twelve to eighteen, eighteen to twenty-four months, and over two years from the onset of toxic symptoms 50, 59, 67, 75, 80, 80, and 87 per cent., respectively, had exophthalmos (questionable cases excluded); (2) if we select from any period in our series twenty-five consecutive patients having hyperplastic thyroids and very mild toxic symptoms, over 50 per cent. had exophthalmos and if we select from the total number of patients coming to operation during 1911 and 1912 the twenty-five patients with non-hyperplastic thyroids having the most intense intoxication, exophthalmos is not noted in a single instance. It is quite possible that exophthalmos may be associated with non-hyperplastic-toxic goiter, but, if so, it is so rare that it must be in a way considered accidental.

Is the symptom-complex accompanying hyperplastic goiter to be directly attributed to disturbed thyroid function? While I have so considered it in this paper only as a matter of convenience for pointing out the association of the clinical and pathologic findings, and do not wish to get into a discussion of this subject at present, I do wish to call attention to a point in support of this theory that, so far as I know, has not hitherto been made, namely, that a person 22 years of age with an adenoma of the thyroid has a definite chance of developing a train of symptoms during the thirty-sixth year so similar to the symptom-complex associated with hyperplastic thyroid that the best-trained diagnosticians are constantly confusing the two conditions.

Can we associate the symptom-complex of non-hyperplastic-toxic goiter with any definite pathologic change in the thyroid? For the present I shall have to answer this question in the negative.

Correlating the statistical data herein given, we may safely come to the conclusion that exophthalmic goiter is a definite clinical complex always associated with hyperplasia of the thyroid and that it should be sharply distinguished from the constitutional state or states that may develop with non-hyperplastic goiter.

RECIPROCAL RELATIONS OF THE CLINIC AND THE LABORATORY IN MEDICINE *

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The clinic has been under obligations to the laboratory since the time of the first post-mortem descriptions of normal organs, and of pathologic changes in organs and tissues. Yet to-day one would pass over the founding of modern medicine by Rokitansky, Cohnheim and Virchow on pathologic and histologic anatomy, to the consideration of the more striking relations of the clinic to bacteriology, parasitology, physiology, physiologic chemistry, experimental therapy and laboratory diagnosis. It is not that pathologic changes in tissues are unimportant, but in the newer fields of research there has been so rapid a development of methods applicable clinically to the accurate diagnosis and to specific therapy and prophylaxis of infective and parasitic diseases, and the correction and regulation of toxic and antitoxic metabolic disorders of a non-invasive nature, that the earlier pathologic investigations must be considered of a former era.

The laboratory has forgotten that the original stimulus for its efforts came from careful observers of clinical conditions. Without this it is doubtful whether the laboratory worker would have shown the patience of his clinical contemporaries, and it is likely that he would have taken himself in despair to other fields.

As a matter of fact, within a few years the clinic has swung far afield from the onward course of scientific medicine in the attempt to avoid the overwhelming strides of experiment and of laboratory application and

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* Read by title, before the American Climatological Association, Washington, D. C., May 8, 1913

from the practice of the results of experiment and observation which are beyond the ken of the unaided eye and hand. It is interesting to note that the first scientific aid to the clinician was through the methods of Auenbruegger, Corvisart and Laennec, assisting the ear.

No one would decry the value of anamnesis, physical diagnosis and experiential and statistical knowledge, any more than deny the complementary relation of the laboratory to such methods; but in certain instances, if not in many, as in diphtheria and epidemic diplococcus meningitis, statistical knowledge has made it evident that the laboratory has displaced the clinic in importance in the complementary relation. This is the fact which most clinicians, the rank and file of practitioners, deny—that there are diseases in which laboratory knowledge counts for everything, and that experience of thirty years develops less proficiency along certain lines than the modern first-grade medical school imparts to its latest graduates.

INDEBTEDNESS OF THE MODERN MEDICAL CLINIC TO THE MEDICAL SCIENCES

To the fundamental sciences of physics and chemistry, medicine is indebted more indirectly than directly, except in the case of physiologic chemistry, which has developed as a branch of chemistry essentially medical in application.

The chemical methods directly employed are of a simple nature and yet the chemical investigations which have enabled an understanding of normal and diseased processes have involved elaborate procedures on the part of highly trained experts. This lack of applicability of advanced complicated methods is due to the fact that chemistry, *per se*, has to do in part with inorganic substances which have so far as known little to do with processes of disease and healing. The chemistry of organic substances which play a considerable part in normal functions and pathologic states has been specialized in as physiologic chemistry.

Apart from the manufacture of anilin dyes, nonphysiologic chemistry has more to do with the synthetic processes for the preparation of drugs than with the workings of a clinic.

From physics many methods have been selected. The stethoscope, the sphygmograph and sphygmomanometer, the various forms of cardiograph, instruments for hemometry, the spectroscope, the polariscope, the calorimeter, the Roentgen rays and radium emanations, to say nothing of the numerous principles of physics applied to instruments for the diagnosis and treatment of diseases of special parts and for mechanotherapeutics and electrotherapeutics, are well known. The most widely used are the stethoscope, the sphygmograph, the Roentgen rays, the hemometric apparatus and the polariscope. There was a day not long since when apparatus for electrotherapeutics was more widely used than far saner methods of therapy, but fortunately this day is passing.

The application of certain principles of physics and the use of physical apparatus play a large part in modern chemical laboratory technic, but are subordinate as a rule to methods of physiologic chemistry, biology, pathology and bacteriology. While for a time such methods were absorbed by the clinic, at present along certain lines, as in roentgenography, the clinic must employ an expert technician and an interpreter of roentgenograms. The progressive clinic must employ an assistant especially trained in this particular branch of physics.

To physiology, as to anatomy and general pathology, medicine in every branch owes not only its allegiance, but also its existence, for without these three fundamental sciences inefficient empiricism would have prevailed, and no modern medicine would exist. It is true to-day that, with the exception of the application of the sphygmograph and the cardiograph and the simpler tests in neurology, the methods of physiology are less applicable to the clinic than to experimental investigation. The highly developed apparatus for such methods must be used by one of special training in physiology.

From physiologic chemistry many methods, both simple and complicated, have been drawn, on account of their applicability, as essential to the clinic for the daily routine for diagnosis. Some of the methods, as the testing of urine for albumin, sugar, indican, bile and blood, are available for any well-trained, proper-spirited physician, and for the fledgling hospital interns who through their laboratory training mainly have proved a worthy asset to the clinic. Many of the methods, however, are too complicated and too time-exacting for utilization without the assistance of properly trained graduates in medicine who have a liking for thorough study and investigation of cases.

This is no reason for not developing the facilities for conducting such work in connection with the clinic, and is an excellent reason for attaching to a medical clinic a trained laboratory assistant. In a well-conducted clinic, for example, the estimation of urea should be made in conjunction with the estimation of the total nitrogen and ammonia and other nitrogen-containing substances in the urine. The estimation rather than the determination of the presence of acetone bodies in the urine should be made by one qualified to do such work. For more advanced examinations for the investigation of problems in physiologic chemistry in relation to medicine the physiologic chemist must be not only consulted but also persuaded to become interested.

In experimental physiology, the elucidation of the nature and the treatment of certain thyroid diseases, and the understanding of circulatory and cardiac disease, stand out prominently among the achievements of modern medicine, as the results of infinite labor and patience of master minds persevering in the face of difficulties and discouragements.

The keen observations of certain contemporaries are comparable to those of Beaumont, Bernard, Gull and Addison. Since the prevalence of the diseases explained by these observations is relatively small compared to those investigated through pathology, bacteriology and allied sciences, it is from the latter that the most beneficent results have come. To pathology and experimental pathology one must credit the understanding of the nature and progress of disease and therefore the significance of a diagnosis and the rational employment of therapeutic measures directed particularly against the alleviation of symptoms, and the eradication of causative agents. Under the influence of pathology have developed bacteriology and parasitology, which have elucidated the etiology of so many diseases, the nature of which pathology had previously determined.

As important as the discovery of the etiologic agents of infection and parasitic diseases, has been the evolution of epidemiology, resulting in the elaboration of the methods for controlling epidemics of yellow fever, malaria, ankylostomiasis, trypanosomiasis, plague and the gradual reduction of the prevalence of typhoid fever. The discovery of "carriers" and the existence of such individuals dangerous to a community, while not well recognized by the practitioner and even doubted by some, should be impressed on medical students as realities to be sought for under certain conditions and properly cared for. Recently attempts have been made in a few instances to determine the number of "carriers" among convalescent typhoid patients in hospitals and so regulate their relations with surroundings that they will not become a menace to the community. From experimental pathology and experimental medicine have come the effective methods of treatment for rabies, diphtheria, tetanus, epidemic meningitis and the prophylaxis against variola. Whether from the clinician, the pathologist or the bacteriologist, such so-called brilliant discoveries have been the result of long painstaking, scientific investigation by minds of the same type, utilizing laboratory methods. The clinician may be a keen observer and may recognize remarkable shades of difference in the symptom-complex of diseases, but the one who explains the meaning and causation of the symptom-complex must be the scientific investigator, exemplified by the leaders in medical science. Most recent are the brilliant results of scientific investigation in experimental therapeutics, and one hopes to see studies in chemotherapy and in scientific investigation in materia medica place drug therapy on a sounder and more wholesome basis.

From the simpler methods of examination evolved through research in the medical sciences has developed the clinical laboratory employing methods available for clinical diagnosis, and necessitating the training of men in cytology and bacteriology and microscopy.

The fact that clinical laboratory assistants may learn readily the simpler chemical and physical methods for diagnosis but that it requires years of application to become familiar with and expert in clinical bacteriology, cytology and the microscopy of parasitic disease is not sufficiently recognized to-day.

THE INFLUENCE OF THE LABORATORY ON MODERN MEDICAL EDUCATION

Experimental investigation in physiology, physiologic chemistry, pathology, bacteriology and therapy have founded the conception, knowledge and treatment of disease on a firm scientific basis and have made necessary the use of laboratory methods for diagnosis and therapy. Without experiment there would be little of science and accuracy in the practice of medicine.

The most striking change in medical curriculums due to the modern conception of disease is the displacement of the didactic lecture and the theatrical clinic by demonstrative teaching and the clinical clerk or assistantship system in hospital wards and dispensary. The student no longer learns the symptoms of disease by memory, and therapeutics by rote, but is made to see, feel, investigate and think before drawing a conclusion. The consultant of thirty years ago lectured to his students and conducted a private clinical laboratory with one or two assistants, and followed with interest the necropsies in his cases, and to-day he teaches his students as assistants in hospital wards and dispensaries, and organizes clinical laboratories with capable assistants to whom he may send the students for a period sufficient to become familiar with the laboratory methods suitable for diagnosis. Students were thus formerly taught to diagnosticate through quizzing the patient and clinical observation, often superficial and perfunctory, since their minds were not stimulated to careful, minute observation by the habit of exactness, inculcated by familiarity with laboratory methods.

To-day a student is taught to diagnosticate through anamnesis, clinical observation, physical diagnosis, physiologic methods, methods detecting structural alteration and disturbance of function in organs primarily involved and in other organs and systems secondarily disturbed and through searching for etiologic factors producing a general disturbance before function is altered in an organ or before a system is attacked. Particularly important is the instruction given in prophylaxis and the prevention of the spread of infectious diseases. Experimental medicine and clinical laboratory methods have revolutionized diagnosis and to a great extent, though not so completely, therapy. The latter retains many of its deplorable features, not so much from faulty teaching as from the extended advertising and commercialism of drug-manufacturing firms, who by individual canvassing, as well as by advertisement and distribution of pamphlets, attract the attention of the young physician as he settles down in an office to await the growth of a practice.

Away from medical centers and university surroundings, the country practitioner should be more vulnerable to the advertised therapeutics than the city physician; but this does not always follow, since the tenor of present medical education leaves a habit of rejecting what is fundamentally wrong in practice. A deplorable attitude of the visiting physician and the practicing physician is that of indifference to necropsies, both in endeavoring to obtain them and in checking up the clinical observations when the post-mortem examination is conducted by competent pathologists. The figures given by Cabot for the coincidence of anatomic diagnosis at necropsy with clinical diagnosis should impress any one with the necessity for arousing interest in post-mortem examinations. Fifteen years ago the pathologists and a few progressive clinicians in this country had stirred some of the profession to activity, but of recent years, notably during the past five years, the clinician's interest in gross pathology has diminished alarmingly. The complacency with which most clinical diagnoses are made, the self-satisfaction with which the therapy is conducted on this diagnosis as a basis, are evidences of a faith unbounded, which should be replaced by careful and repeated observations to ascertain the facts before final judgment gives forth a diagnosis.

The figures quoted by Oertel, as those by Cabot, demonstrate how erroneous conclusions may be in medical practice even when based on the most painstaking clinical investigation assisted by careful laboratory tests.

This lack of interest in necropsies and this self-assurance in respect to clinical diagnoses have infested the hospital interns, excepting in a few institutions. It would be the better part of wisdom to insist that the hospital intern, if having through instinct and ambition no interest in necropsies, should be trained to appreciate their value, as the student is trained, and even made to perform, under the supervision of the pathologist, certain necropsies in cases from his wards.

The student in the best schools is trained to appreciate the knowledge gained through necropsies, but as a hospital intern, under the influence of experienced clinicians, his appreciation wanes and is often replaced by indifference to post-mortem examinations as to many other laboratory methods and other conceptions of disease taught previously by the laboratory departments.

Few clinicians are capable of performing necropsies, and it would not be desirable for them to undertake to perform them to any extent, for them the pathologist the most efficient reports are obtained; but the former, much to the satisfaction of the latter, might give evidence of a sincere interest in post-mortem reports.

The clinical clerk or assistantship system is a development *pari passu* with the laboratory and demonstration method of teaching. The lack of a sufficient budget as a rule limits clinical laboratory development in most teaching institutions, and the lack of realization of its importance limits it in hospitals, health resorts, and in private practice. Clinical laboratories will not be generally used until the present generation of laboratory-trained students replaces the passing generation of practitioners.

PRACTICAL DEVELOPMENT OF THE CLINICAL LABORATORY

For the Various Clinics of the Dispensary and Hospital.—Under the preceding paragraphs laboratory methods applicable to the clinic have been mentioned.

The best system of utilizing such methods is under dispute, judging from the organization of laboratory facilities in different medical schools and hospitals. Whether each clinical department shall develop within itself laboratory facilities which it needs or thinks it needs, according to its director, or whether a single clinical laboratory department to care for the needs, particularly along advanced lines, of the different clinics, shall be established, may depend on many factors. In the first-grade institutions for teaching and practice there is no doubt but that the latter method is preferable, as a system. The former method generally results in the assignment of the laboratory work to recently graduated assistants, who retain their positions, even as directors, for two or three years, so that the position is one of a rotating hospital intern or medical school assistant, which necessarily implies lack of familiarity with more advanced methods, and therefore lack of efficiency in teaching. And, strange to say, this system still prevails in medical schools which first introduced the laboratory assistantship to the medical clinic in this country. This is not so on the Continent. It is wise to relieve the student of much of the advanced routine and to concentrate his attention on some new or advanced method as an object of research.

Many advanced laboratory methods applicable to the diagnosis of conditions other than those of the medical clinic should be made available, through a central clinical laboratory, for other departments of the school and hospital. In some hospitals the interns are pathologic assistants during the first six months of service. The fault in this system is that after the sixth month the intern may do little or no laboratory work, if so inclined and not interested; and since laboratory examinations are made for him, as for his visiting physician, he forms the habit of having his work done for him, and later on in practice of neglecting to have it done. Six months' training is not sufficient to form the habit of doing such work as may be done by the practitioner.

In other hospitals, and the number is few, a clinical laboratory well conducted by the director of the pathologic laboratory or by a clinical pathologist is maintained, which results in the work being done on a high plane and in stimulating students and interns to interest themselves in laboratory study of cases throughout their service and thereafter in practice. This is by far the best system.

Again, in a few hospitals, the clinical laboratory work is conducted by young assistants attached to the medical and other clinics, and under their supervision by the interns; and while this method stimulates the interns and habituates them to the value of such work in practice, it maintains the laboratory service on a lower plane, since the recently graduated assistants, as directors of the laboratory and not under the supervision of a pathologist or clinical pathologist, do not reach the proper degree of efficiency in advanced methods during their short term of service.

The development of a clinical laboratory is, as a rule, considerably more advanced for medical than for surgical work and other clinics in hospitals. That this need not be so, and that a surgical clinic may benefit vastly by utilization of well-developed laboratory facilities, is evidenced by the superb organization at Rochester, Minn.

For Health Resorts of a Special and a General Nature.—Laboratories established at health resorts, in this country particularly, are for routine efficiency as part of a money-making venture, and, therefore, even when well conducted in their beginning by able men, become obsolete in methods and fall below the standard through lack of facilities for conducting thorough experimental studies, and the absence of the stimulating atmosphere of a university medical school or of experimental institutes.

The directors of health-resort laboratories might keep in touch with, and even be proficient in methods if they had the habit of visiting ocasionally university medical schools for courses of study; but as it is to-day, such visits are for a few fleeting days to clear up a theory, or obtain superficial acquaintance with some one procedure demanded by their clientele. There is no reason why such resorts should not take cognizance of the complications which afflict so many of their patrons, as well as of the disease with a name for which they ply their therapeutics, and occasionally search for the causative factors in diseases with which they become familiar clinically. Many instances will come to mind of worthy examples to follow.

For the Physician in Private Practice.—Within a few years there has developed in certain cities what may be termed a cooperative investigation association for diagnosis, the details of which may be obtained in Richmond, and in many smaller towns throughout the state of New York, and probably in many other states. Through a cordial cooperative system the laboratory knowledge of the recent recruits to the ranks of practitioners is made available to the mutual advantage of patients and the profession.

The influence of proper laboratory teaching is such that the student looks on disease from a different point of view from that of one who lacks such training. This point of view is that of always searching for the etiologic diagnosis, regardless of the name of the disease, and for the possibility of applying specific therapy, and results in the careful study of each case by all methods available. There is no question that the ultimate product, previously trained with such a point of view, is the more thorough diagnostician, and therefore one more capable of right practice, and this will be borne out by the next few generations of physicians who in practice will modify the present attitude of the average practitioner.

The length of time required for laboratory training is probably longer than for clinical training, to bring one to the same degree of proficiency in each, and it must not be forgotten that during the laboratory training the student and instructor are in close touch with the clinical aspect of each case. The specialist is such through his familiarity with the clinical and laboratory methods of diagnosis and therapy; and the new generations of family physicians will come into their own again on account of their ability to apply laboratory methods to practice, provided the medical schools live up to their possibilities.

ADVANCEMENT OF LABORATORY-TRAINED MEN TO CLINICAL POSITIONS

If one recalls the progress of clinical medicine during the past thirty years, one will appreciate that the most renowned and advanced clinics are those which have attached to themselves competent laboratory assistants and have been in close touch, amounting to cooperation, with the laboratories of the medical sciences or institutes of science allied to the medical sciences, and whose directors are men well trained in laboratories, as in Baltimore and Munich.

As feared by some there is danger in giving clinical positions to men who have done purely experimental work and little of it with one or two experimental successes, and to men long trained in one medical science. A man of such training with no clinical experience must of necessity submit to clinical training before efficiency for holding a clinical position is obtained, even as the clinician who has not previously had the requisite laboratory training, which is considerably more than there is time for in a medical school curriculum, is unfitted to direct a progressive medical clinic.

One cannot agree with many of the recent statements of Bevan.[1] Laboratory-trained men are not against the clinician, but would have the clinician made after a new pattern, thoroughly learned in laboratory methods through three or four years' experience while a clinical assistant, so that he may understand and interpret properly the utilization of physiologic, pathologic, bacteriologic and biochemical methods for diagnosis and for therapy.

Professors in medical sciences should be men who know considerably more of the subject they teach than the clinically trained men in medical schools ever hope to know on account of the little time the active clinical man can give to keeping apace with any medical science. The latter are not suitable for medical sciences, since the facts in detail, the truth entire, should be known by one, in order to teach the sciences, and it is impossible, with the tremendous development in the past twenty years, to be trained to teach in the medical sciences, unless one is a specialist, and often a specialist in one branch of a medical science.

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[1] Bevan, Arthur Dean: Medical Education and the Hospital, The Journal A. M. A., March 29, 1913, p. 974.

Inspection of Water-Supply.—Let me for a moment note the fact that we have a most thorough inspection of the milk-supply, of our meat-supply, of food adulterations, but in how many communities in this country have we properly protected not only the inhabitants, but the stranger and traveler from infection by preventing the drinking of contaminated water from pumps and wells? You ask the average farmer or average person what he thinks about the water in the well on his premises and he will invariably tell you that the water is pure, clear and sparkling; and yet how many of these wells may not be contaminated with pathogenic germs? The inspection of many other things is no reason why a most thorough inspection should not be made of the wells, lakes, rivers and streams that all water supply not only in the cities but in the farming districts should be guarded. The state or county should order a most thorough control, and a periodical examination should be made and an official notice posted at all sources of water supply, stating the condition of the water, whether it is pure or otherwise, whether it is liable to bring about a disturbance of the gastro-intestinal tract or not.—Francis E. Fronczak, in *American Journal of Public Health.*

EPILEPSY AND PARESIS IN RAILWAY ENGINEERS AND FIREMEN *

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Although on several previous occasions medical men have called attention to the fact that epileptics and paretics are among those employed in connection with the running of trains and motor-cars and to the obvious dangers incident thereto, the subject has not apparently been given much consideration by the transportation companies, at least, so far as I have been able to ascertain by questioning the medical men they employ.

My attention was attracted to the subject through seeing three cases of epilepsy and two of paresis in the course of two years in men who were employed either as enginemen or firemen on locomotives.

While this is not a large proportion of the total number of cases of epilepsy and paresis seen by me, the points to be made are that these men were engaged in an occupation that made the disease a distinct menace to the safety of the traveling public as well as to their own, and that something could and should be done to prevent their employment in such occupations.

An abstract of the histories of these cases is as follows:

Case 1.—A. T., a railway fireman, aged 28, came to the hospital Sept. 28, 1912, because of having "bad spells." There was no history of nervous or mental diseases in the family. The patient was single, denied venereal disease, and showed no history of trauma. He did not use alcoholics, but smoked a considerable amount of tobacco.

May 27, 1912, he had the first attack of which he had any knowledge. He lost the power of speech, had a "faint" feeling through his stomach, his arms trembled, and finally he lost consciousness. He did not have incontinence, but bit his tongue in the attack and felt weak after it. About three weeks later he had another attack, similar except that he did not bite his tongue. About two weeks later he had still another attack. The attacks were all ushered in by the same aura and none of them occurred on the engine while at work. A neurologic examination was practically negative. The urine, blood and blood-pressure findings were negative and a physical examination was negative. The Wassermann reaction on the blood was positive. An examination of the fundi oculi and of the nose and throat was negative.

During his stay in the hospital he had an attack in which he first became apparently speechless, pointed to one of his companions and mumbled and then fell out of his chair. He bit his tongue and made a few convulsive movements. He was unconscious altogether about five minutes. Following the attacks he could answer questions, but was dazed. He returned to his position because he said that he was about to be promoted to be an engineer and did not wish to lose his place.

Case 2.—W. B., a railway fireman, aged 27, was admitted to the hospital July 8, 1911, complaining that at times he was irrational and had a headache. His family history was negative so far as could be learned from the patient. He had had only the ordinary diseases of childhood and denied venereal diseases.

The patient stated that the trouble came on in March, 1911, beginning with severe headaches which were accompanied by some visual disturbances. At times he had attacks of epileptic automatism; for instance, he arose at night and ran out of the house, running for almost a mile. At other times he had convulsive seizures. All the attacks occurred in the evening or at night. The neurologic and the physical examinations were negative. The examinations of the blood and urine and the Wassermann reaction were negative.

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* Read in the Section on Nervous and Mental Diseases of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

The case was one of epileptiform attacks, possibly caused by beginning organic brain-disease. He did not intend to return to his work after leaving the hospital.

Case 3.—V. H. S., a railway fireman, aged 29, came to the hospital complaining of attacks of unconsciousness, April 9, 1911. The family history was negative and there was no history of epilepsy. He denied venereal diseases and used alcohol very moderately.

About nine years before his admission to the hospital he had a fall and, following the fall, a severe headache. About a month after this fall he suddenly became unconscious and remained unconscious for two weeks, after which he apparently recovered completely.

His trouble began eighteen months before his admission to the hospital with attacks of unconsciousness. In the first attack he was told that they tried to awaken him and could not. It came on while off duty, when he was asleep. The second attack occurred after a hard day's work. He went to sleep and when found was purple, with wide-open, staring eyes. On his admission to the hospital he was having attacks about every two months. They always came on while he was sleeping and he would soil the bed and occasionally bite his tongue. During the daytime he complained of attacks which he described as dizziness. He did not fall in these attacks, but they were actually attacks of momentary unconsciousness, in which he became slightly pale, had a staring expression and would not respond to questions. The neurologic and physical examinations of the patient were entirely negative.

RAILWAY MEN WITH PARESIS AT STATE HOSPITAL, KALAMAZOO, MICH., FROM JULY, 1910, TO FEBRUARY, 1913

Name	Occupation	Age	Date of Onset	Date of Admission	Remarks
B. C.	Engineer	45	October, 1908	October, 1911	
H. R. S.	Car inspector	37	January, 1907	May, 1912	
S. T.	Fireman	40	February, 1911	January, 1912	Would forget signals and had to be told to shovel coal.
C. F. T.	Engineer	55	June, 1909	July, 1911	
J. L.	Flagman	65	February, 1911	March, 1911	Had allowed a train to run into a street-car 2 weeks before admission.
W. V.	Railroad work	50	November, 1906	December, 1911	
F. M. C...........	Motorman	37	June, 1910	June, 1911	Discharged because of his queer talk.
S. G.	Engineer	31	June, 1911	October, 1911	
W. H. S.	Railroad clerk	52	December, 1905	December, 1910	In 1905 his car ran away from him and he was injured.
E. E. S.	Railroad clerk	53	....	....	Nothing of importance.
A. C. H.	Railroad brakeman	37	August, 1911	July, 1912	Nothing of importance in history.
C. L. B.	Engineer	40	November, 1910	October, 1911	Was discharged in October, 1911, after a wreck.
W. H. D.	Engineer	56	March, 1912	November, 1912	

The diagnosis was epilepsy of the grand mal and petit mal types.

Case 4.—B. K., an engineer, aged 56, came to the hospital June 10, 1911, complaining of nervousness and difficulty in vision with incontinence of urine. His family history was practically negative. The patient denied that he had ever had venereal diseases and said that he had never been ill before nor had he had any injury. He said that he was married and had eight children. He had been working at his occupation up to the time of coming to the hospital.

On examination he appeared very nervous and confused. There was a marked disorientation of time and space. He talked disconnectedly, and could give little or no information regarding his present illness, except that he had had more or less incontinence of urine for two years. He stated that he felt very well; "his only trouble was that his wife wanted him to take black pills and he wanted to take white." He obeyed commands but apparently did not fully comprehend what he was doing. There was a marked tremor of the hands when moving. His speech was typically paretic. His pupils were small, with no reaction to light, and the tendon reflexes of the lower extremities were not obtained.

The diagnosis was paresis, of at least two years' duration before his admission. His commitment to an asylum was advised.

Case 5.—P. B., railway engineer, aged 46, complained chiefly of numbness on the left side. His family history was negative. He had always been healthy. He did not use tobacco or alcohol and denied having had venereal disease.

His trouble began in February, 1909, when he had an attack in which he found that he could not use his left arm and could not talk. This attack lasted about ten hours, but he was not unconscious. In April, 1909, he had another attack, in which he did not lose his voice, however. The attack in this case was over in about fifteen minutes. From then until July he had similar attacks, sometimes as frequently as once a week, was never unconscious and never bit his tongue. In July he had an attack which affected the right side. On his admission to the hospital he had no special complaints but spent nearly all of his time in writing a very elaborate diary and many letters. He had an attack while in the hospital in which he lost his voice, he would not obey commands, and his arms and legs were rigid. He remained in this condition for about half an hour. He had no memory of occurrences during the attack.

The examination showed unequal pupils, with a sluggish reaction to light. The knee-jerks were exaggerated about equally on both sides, but otherwise the examination was negative. The examination of the spinal fluid gave a positive Wassermann reaction and showed an increased number of lymphocytes and an increased amount of albumin. He was overanxious while in the hospital to get back to work on the railroad; he said that the president of the road had written to him and that he wanted him back. He insisted that he felt as though he could work just as well as he ever could.

I am not alone in my experience in this connection. In 1908, Dr. P. C. Knapp[1] called attention to general paralysis as a menace to public safety in transportation, and a committee of the American Neurological Association reported[2], in 1910, on the number of paretics in asylums who had been employed by transportation companies. The committee practically confined its attention to paresis and gave the statistics for a number of hospitals and asylums, mostly in New York and Massachusetts.

Statistics furnished me from the State Hospital at Kalamazoo, Mich., and given in the accompanying table, show that there were eighty-seven patients with paresis admitted from July, 1910, to February, 1913, and of this number thirteen had been employed by railways in positions connected with the operating department; five were engineers.

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[1] Knapp, P. C.: General Paralysis as a Menace to Public Safety in Transportation, Boston Med. and Surg. Jour., 1908, clviii, 187.

[2] Tr. Am. Neurol. Assn., 1910, p. 238.

Whether or not the occupation has anything to do with the development of the disease I do not know. The constant nervous tension may have some influence in this respect, but the conclusion is certainly justified that there are men at work on railways in responsible operating positions who are epileptics or paretics.

If so much is true we may go on to consider what the result might be. In the report of an accident occurring in the past winter on one of the New York elevated lines, it is said:

> The accident, it has been charged, was due to the fact that the motorman in charge of the second train was not looking ahead, as he should have been doing. This, if true, affords an excellent illustration of the statement made by railroad officials that no matter how excellent may be the equipment of a train, or the mechanical and other devices installed for the purpose of safeguarding the line against accidents, unless the man directly on the job, be he engineer, motorman, conductor, flagman, signalman or brakeman, attends strictly to his duties and has his mind at all times on what he is doing, accidents are likely to happen.[3]

It may be objected that after an epileptic fit no man would be employed further in such a position and that the patient himself would wish to leave an occupation which his infirmity makes dangerous to himself and others. In respect to these points it can be said that frequently these patients do not know that they have epilepsy. They have attacks supposedly due to heat-stroke, indigestion, etc., or the attacks may be of the petit mal type with no consciousness of their existence on the part of the patient and no signs apparent to the casual observer. My own experience has convinced me that even when the patient does know the nature of his trouble, economic necessity may persuade him to take the chance and continue at his work.

In the case of paresis the patient usually has no true insight into his condition. He may complain of some of the symptoms—memory impairment, attacks, etc.—but he usually insists that he is quite capable in his work. The dangers in case an epileptic or a paretic is at the throttle of an engine, or in other situations that require an interpretation of signals and orders and constant vigilance, are too apparent to require extended comment. A certain number of accidents have surely been so caused; whether some of the serious accidents which were apparently caused by a deliberate disregard of signals or orders have been due to the same factor seems not at all unlikely.

There would be but little object in calling attention to this state of affairs if there were no way in which it might be remedied; but this, I feel sure, is not the case. I am reliably informed that all applicants for positions of this character are medically examined before they are accepted, and that for some of these positions repeated examinations of the vision are made. Different railways have somewhat different ways of carrying out these examinations, but no matter how these examinations are made the following points could be provided for:

Since we know that cases of epilepsy and paresis do exist among those to whom the running of trains is entrusted, and since the presence of these patients in an occupation of this kind is dangerous to them, to the railway companies and to the traveling public, it would be to the benefit of all concerned if the medical examinations included careful and frequently repeated inquiries into the presence of symptoms indicating the existence of these affections and, more important still, the use of objective tests, such as those of the pupillary reflexes, best calculated to demonstrate their presence and not requiring too much time in their performance. The selection of the tests to be employed and the value to be placed on each might be determined by an expert appointed by the company, who might then instruct the company's regular examiners either by printed instructions or by lectures, or better still by demonstrations in the use of these tests. A series of such tests might be given in a short time, and many of them simply noted in the course of other routine examinations. While such simple tests might not be absolutely diagnostic, they would have some advantages over the present method of diagnosis, that is, waiting for something to happen. If the suspicions of the company's regular examiner were aroused by his inquiries he could refer the man to a consultant who could make more extensive examinations.

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ABSTRACT OF DISCUSSION

Dr. C. Eugene Riggs, St. Paul: Some years ago I read a paper before the Mississippi Valley Medical Association on the subject of epilepsy as a menace, and I called attention at that time to the facts set forth by Dr. Camp. I also made reference to paresis, and recommended that, instead of having examination of engineers made simply by a physician or surgeon, there should be a competent neurologist to pass on all these employees whose condition is so vital to the welfare and work of a great railway system. My paper was called forth by a serious accident that happened in the East, evidently the result of a minor epilepsy on the part of the engineer.

Dr. C. B. Woodson, St. Joseph, Mo.: I have seen a number of paretics who were engineers and firemen on railroads. Some years ago a man who denied syphilitic history was running a passenger train on one of the most popular roads in our state, when he became violent and was overpowered by his fireman, who stopped the train. This man died a paretic in the state hospital. Another case that impressed me forcibly was that of a conductor on a freight train. He was brought to me by his family physician and I diagnosed the case as paresis, not, however, in an advanced form. The patient finally consented to go to a sanatorium, and he was observed sufficiently long to convince the family that he had paresis. While he was running on the train he had a fight or two with his brakeman, but the latter had superior strength and overpowered him. In reading of various accidents on railroads and of the persons responsible for them, it has occurred to me that possibly the greatest menace is the train-dispatcher. Recently there came under my observation a chief train dispatcher of an important system of railroad in the West, and I found that he had the jacksonian type of epilepsy. A serious wreck recently occurred near the capital of the state, and the train-dispatcher, who had been regarded as a very competent man, says that he was not well at the time. There is absolutely no reason why advanced paresis should not be recognized by any one who hears the patient talk or observes him closely, even excluding the Wassermann, but if the Wassermann is brought to our aid designing physicians and patients can not take issue with it. It would be cheaper and far better if the railway companies would give a little attention to this condition in their men. It would be an easy matter to have them placed in an institution for the purpose of observation.

I believe that if a body like this Section would set forth to the managers of railways the dangers incident to conditions of this kind not only as a menace to life, but also as needlessly subjecting them to suits for damages, they would look into the matter further, and some satisfactory method of examination of employees would be arranged for.

Dr. D. S. Booth, St. Louis: This to me is an important subject, as I have been connected with railways ever since

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[3] New York Sun, Sunday, March 16, 1913

I have been in practice. I do not think that it is the custom of railway companies to employ knowingly any man who has either of these diseases; but the difficulty is to discover them. Murder and robbery are not permitted by law, but both are still going on. The only method we have of discovering these patients is when they come under observation. When the applicant seeks to enter service the examiner is not going to observe this condition, and the man will not tell him about it. Even after obtaining a history of venereal disease my greatest difficulty is to differentiate the diagnosis of these cases in order to prevent the men from going to work. Coming under the observation of the company's doctors is, I might say, tantamount to discharge. The men know these things and go to other doctors for treatment, and we see nothing of them until something happens perhaps that we have never seen in our service. I do not think that I have even known of an accident occurring as a result of these diseases. Recently a case has come under my observation which several years ago I diagnosed as epilepsy, but from the fact that it was the nocturnal form, and, further, that the patient was supported by outside influence, medical evidence perhaps and probably a brotherhood, and that he was on a switch-engine, he was permitted to retain his position. A few weeks ago he had an attack on his engine. If we do not have the support of the profession we certainly cannot prevent these things, and I, for my part, should be delighted to have any one give me an insight into how to detect these cases early, before the patients show any symptoms or serious accidents occur.

Dr. L. Harrison Mettler, Chicago: I do not think that there is any question but that it is expedient for railway companies to recognize as early as possible a case of disease on account of which life is exposed to danger. A friend told me that his father, an engineer on a run of only a few miles, but on a fast train, had figured out the number of things an engineer had to carry on his mind during that time, in order to be ready to meet emergencies. I expected him to say a large number, but was amazed when he told me that there were seven hundred different things to be borne in mind. The results of his investigation were published, I think in *Harper's Magazine*. He remarked that people seldom realize that when an engineer starts out on his run he must at once put his mind on parts of the engine, signals, orders, etc., and that in that short space of time this particular engineer had to carry absolutely in his mind and be prepared to meet about seven hundred emergencies. I raise this point simply to suggest that I have often wondered whether or not the strain has something to do with these conditions, in addition, of course, to actual disease, in some of these cases. Of course, diseased men, we know, ought not to be on an engine. But the strain has a tremendous import in these cases, and there is no question but that a long rest will help even non-diseased engineers.

Dr. W. Brown Ewing, Salt Lake: My experience with railway work has been that examinations are perfunctionary. The companies have a long list of questions regarding mumps, measles, vaccination, etc.; the applicant says yes or no; as he perhaps happens to have his legs crossed, one leg is tested; urinalysis is made—and that is about all there is to it. This condition has been largely forced on the companies by the men themselves. Some surgeons of railways are not allowed to strip a patient. They may turn down his shirt in front and examine his lungs with a stethoscope and his heart in the same way. A neurologic examination is never heard of so far as my experience goes. The patients whom I have had on the Denver and Rio Grande Railroad have worked for years without any suspicion of epilepsy, paresis, or any similar disease, until within a short time before they were referred to the neurologist. Another unfortunate feature is that a true epileptic is not always removed, be he telegraph operator, engineman, conductor or brakeman who acts also as a switchman, and it is not always possible to have these men removed. The labor unions have reached the point now at which they contribute 10 per cent. of the hospital fund and have 90 per cent. of the say as to what shall be done with it. That one feature will, it seems to me, force the companies to do away with collections from the employees entirely, and then treat only cases of injury or sickness in the line of duty.

Dr. Sanger Brown, Chicago: It seems to me that it is going to be a difficult matter for us to suggest anything that would be of particular value in carrying out the purposes which Dr. Camp evidently has in view, that is, the protection of the public. I do not believe that we can do anything of any particular use, as physicians, so far as epilepsy is concerned, because we know very well that there is no extended examination made between the seizures to enable us to say with any degree of positiveness that the patient is subject to epilepsy, unless the case has advanced so far that the surgeon can easily detect it. In many cases, however, we can determine with a great deal of certainty whether or not the patient has tabes or paresis.

This matter would not be materially helped by a rigid examination at the time the patient applied for employment. Usually he is a young man then and he would not have the symptoms of either tabes or paresis; after all, the main danger arises from the disease affecting those men who have been in the employ of the company for a number of years and who hold responsible positions. The serious disasters that have occurred have come about in this way: Some trusted employee was attacked with some of the episodes of these two diseases, giving rise to a disaster. We have all examined cases of aged men who occasionally come to us. I recall one case now. A man of about 45, who considered himself in good health, was about to cross a bridge when, as he expressed it, something gave way as though he might have been struck by lightning, shock came over him, he was blind for a few moments and had to be led into a drug-store where he was taken care of. An examination of that case probably a year before would have shown that that man had no knee-jerks and no pupillary reflexes. It is these sudden episodes that cause accident. I recall the case of an engineer who said that the light suddenly went out of one eye while he was running his engine, but fortunately the vision of the other continued until he could get to a place of safety. I cannot see how we could expect to do anything more practical than to recommend some method to protect the public against these episodes, and possibly the public might consider that any action along this line would interfere with public liberty. That is what we hear as soon as we invoke any arbitrary rule. If the employees in responsible positions were required to submit to a thorough examination, say every year or two, it seems to me this would greatly minimize these dangers. I do not think that much would be accomplished by an examination, no matter how rigid, if it were made only when the person applied for employment.

Dr. Leo M. Crafts, Minneapolis: This subject is of great importance. I hope that Dr. Camp's suggestion will be acted on favorably. I think that we should also include the word "taboparesis." I am reminded of a case that I had about twelve years ago, that of an engineer who had been on the road for several years and whose removal I advised because of tabes. He had marked symptoms, could not walk without a cane, had loss of reflexes, etc. I am not sure whether he had diplopia or not while I saw him. In trying to go through the living-room of his house he became lost and had to hunt around to get to the door. He was sent into the country for about a year's rest, and at the expiration of this time he came into my office and asked for a certificate to go back on the road. I refused to give it to him, stating that he had no business on the railway again. He was not persuaded, however. I heard nothing from him for three or four years, when he sent his compliments to me, and I found that he was back in the service running a switch-engine in the yards of a western city. He must have been taken back on the railway by virtue of his engineer's certificate, for it does not seem to me that any examiner would pass such a case.

Men occupying important positions in the service should be examined once a year, as Dr. Brown has suggested, and, referring to Dr. Ewing's remarks, we ought to urge the doing away with blank forms of examination. We should make out our own complete, independent report, regardless of any forms. A safety campaign is now being carried on over the country generally—a campaign that applies to the public, but I do not see that it applies much to the officials or others running corporations. If this safety campaign is needed, it should reach the officials of the railways and be taken up in the surgical associations of the different companies.

Dr. Lawrence B. Pilsbury, Lincoln, Neb.: Some time ago there was brought to the Nebraska Hospital for the insane a young man of about 30 who had been employed by a large railway system to operate a switch-tower at a junction in one of the smaller towns of the state. The management of this road is a careful one and few disasters occur, but this man had been working so recently that his last pay-check was sent to him after he had been committed to the hospital. This young man had evidently not attracted attention. The only obvious physical sign he showed was foot-drop caused by injury of the muscles of the foot in childhood, a defect which had never been repaired. The man was apparently and unquestionably a paretic, and that he should have been in charge personally of signals and switches, alone in the tower, was obviously preposterous.

Dr. Charles Gorst, Mendota, Wis.: No position connected with a railway is more important to the public than that of the man who runs a locomotive on a passenger train. I believe that a man's personal liberty should not be considered when he is incompetent to fill so important a place. My experience of nine years in the position I now hold, that of superintendent of the hospital for the insane, Mendota, Wis., emphasizes the fact that if proper investigations were made many men who are employed by the railway companies would be found to be incompetent long before the fact is ordinarily discovered. I do not know of any case in which such a man has been found to be *incompetent and discharged* by the railway company before he has committed some act for which the authorities have taken charge of him and committed him to an institution.

There is no question but that Dr. Brown's idea of frequent examination of employees by properly qualified men is the proper one. I see no reason why this Section should not do what it can for the protection of the public by passing a resolution favoring such examination. A man who was insane in our institution for years and was transferred as a chronic case to a county asylum was paroled by the superintendent of that institution to his brother and soon after was employed by the railway company and made flagman in the yards through which thousands of people passed on trains daily.

Dr. Charles W. Hitchcock, Detroit: A few years ago I saw a case of well-developed paresis in an engineer who later experienced a remission and so far recovered that he made a trial trip with another engineer; but becoming convinced that he would never be able to gratify his desire, he committed suicide.

Dr. George A. Moleen, Denver: I am reminded by Dr. Camp's paper of a case of specific thrombosis. About eight years ago a man presented himself with partial paralysis of one side of the body. In the course of the record it developed that he had been a fireman and was still in the employ of the railway company. He had frequently had lapses of consciousness prior to the onset of the weakness which he experienced, and he admitted that often he lost and resumed consciousness to find that the water level in the gage was considerably below the visible line. It occurred to me then to wonder whether or not some of the explosions that sometimes occur might not be due to lapses of this kind. From this it would seem that it is not only paresis, locomotor ataxia and epilepsy to which we should direct our attention, but also syphilis itself. I quite agree with Dr. Brown that examinations should be made at intervals, but the interval of two years is too long. If I recall correctly, the primary infection in this person was about eighteen months previous to the time of the manifestation of the symptoms. When we recall the lapses of consciousness and the possibilities of automatism and automatic acts on the part of men entrusted with the control of engines and having in their charge the lives of many individuals, we begin to shudder as we contemplate these conditions of mind. I think also we have all come in contact with the conditions in arteriosclerosis in which there are epileptiform seizures with a period of unconsciousness, and these acts are often committed by old and trusted employees.

Would it not also, then, be well to examine the condition of the arteries, as evidenced by blood-pressure, at stated intervals? I think that this is a serious question.

Dr. C. D. Camp, Ann Arbor, Mich.: In considering this entire subject we must also, of course, consider the point of view of the railway company, inasmuch as they do not wish to go to any prohibitive expense in making examinations such as the appointment of a competent neurologist might entail. Furthermore, the thing must be done in such a way that the men will not feel that they are continually being spied on.

In the case of one road, the consulting ophthalmologist has a clerk at each of the division points to make visual tests every six months; these clerks, of course, become rather expert. Then the head consultant has several assistants who go about, and whenever a case with any defect is reported to him, it is referred to one of these assistants.

The man who examines the visual acuity repeatedly could also examine the pupillary reflexes without very much additional time, and he could with an ophthalmoscope take a look at the eye-grounds without consuming much time. In the same way the man examining the employees, as they are examined frequently, or even the man who is examining the eye, could make it a practice to test the knee-jerks, without telling why he is doing it.

There could also be a simple suggestion to examiners that they should always inquire for dizziness, that they should ask to see the tongue and incidentally look for masses; in fact, *those little points* which after all have the highest diagnostic value, could be put in a series of instructions to examiners. I think it should be emphasized, too, that we are not making these examinations entirely for the benefit of the public. After all, the employee himself is very likely to suffer in a wreck; and the railway company is certainly going to suffer as the result of a wreck if it is obliged to pay damages. If we emphasize these two factors, the public will come in for protection at the same time.

FEDERAL CONTROL OVER THE MANUFACTURE OF SERUMS AND VACCINES *

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Under the authority of an Act of Congress, approved July 1, 1902, the Public Health Service maintains a supervision over the manufacture and interstate sale of viruses, serums, toxins and analogous products. In accordance with the provisions of this act, regulations have been promulgated in regard to the licensing, inspection and examination of the products, and also for the suspension or revocation of the licenses of those engaged in the production of biologic preparations for sale in interstate commerce or for importation into the United States.

While the law conveys very broad powers in respect to the supervision of manufacturers and their products and permits restriction of the interstate sale of evidently harmful articles of this kind, it does not give specific authority to refuse to issue a license for a product of unknown or doubtful therapeutic value. The possible abuses that may arise because of this omission are so many and varied that it would appear desirable that further legislation be secured, so as to provide for the proper labeling of all biologic preparations that are still in the experimental stage. Such a precaution on a label would tend to do away with the promiscuous use as therapeutic remedies of biologic preparations which are not thoroughly established, and would thus serve as a safeguard to physicians and their patients. Lacking authority to provide for the differentiation between products of established therapeutic value and those of an experimental nature, the Public Health Service has not been able to take satisfactory action in regard to many of the preparations now on the market which are frankly empirical and almost warrant the appellation of "shotgun remedies." Some of these preparations have either been put on the market by misguided manufacturers or are being marketed and even advertised, because of a supposed demand, with a full knowledge of their lack of scientific basis. Unless it can be shown by satisfactory tests that such preparations are directly harmful or are based on demonstrated false premises, their sale cannot be prevented under existing law, though they may have no therapeutic value and may even do harm to a patient because of his generally lowered resistance to toxic substances.

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* Read in the Joint Meeting of the Section on Practice of Medicine with the Section on Pharmacology and Therapeutics of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

The justification for existing legislation is amply evidenced by the marked improvement that has taken place in biologic products and in the methods employed in their production. Since the law went into effect there has been a marked improvement in vaccine virus, so that "sore arms" are exceptional rather than the rule, as was formerly the case. On account of commendable competition in developing methods of purification, diphtheria antitoxin is of a higher potency, and serum reactions are now comparatively rare occurrences. Contaminated and weak serums have been detected and caused to be withdrawn from sale; a standard for tetanus antitoxin has been established, so that this important serum is now of a known and higher potency and definite dosage can be had; false and misleading labels have been to a large extent changed; and, in general, the manufacture of biologic products has been placed on a much higher basis as regards their purity, potency and methods of production. While the greatest good from the enforcement of the law has been to the physician and his patients, it has also been of great value to the careful and well-equipped manufacturer in forcing the less careful and poorly equipped producer to comply with the official requirements by improving his methods and facilities so as to insure uniformly safe and potent products.

In connection with the enforcement of this law a large amount of research work has been done in the Hygienic Laboratory. Other than the elaboration of standards of potency for diphtheria and tetanus antitoxins, I wish only to call attention to the work of the Public Health Service in furthering the use of antirabic virus for the prevention of rabies. Up to 1908 practically the only way in which a person could receive antirabic treatment was by going to some Pasteur institute, which frequently necessitated travel for a long distance. As a result of work done in the Hygienic Laboratory it has been shown that the virus may be prepared and shipped long distances and in this way the prophylactic has been made available for many who would not otherwise have received it. During the past five years antirabic virus for the treatment of over 4,000 persons has been sent from the Hygienic Laboratory to state boards of health and others entitled to receive it.

HOW SUPERVISION IS MAINTAINED

In accordance with the law and regulations framed thereunder, all persons or establishments engaged in the manufacture and interstate sale of viruses, serums, toxins, etc., are required to be licensed by the Secretary of the Treasury on the recommendation of the Surgeon-General of the Public Health Service after an inspection has been made of their establishments, methods and products. An inspector visits the establishment and examines carefully into the sanitary condition of the buildings and the condition of the animals, if animals are used for the production of the biologic product, and learns from those who have charge of the scientific work the technic employed; for instance, the methods of bleeding, collecting and storing the products and especially the methods used for safeguarding their purity and potency. He looks into the labeling of the products, paying especial attention to the date when they are labeled to be exchanged. Samples of the various products are also obtained and forwarded to the Hygienic Laboratory for examination.

Foreign establishments desiring to do business in the United States must submit to the same conditions and are required to have a license similar in all respects to that of domestic firms. The collectors of customs are empowered to detain at ports of entry biologic products pending examination in the Hygienic Laboratory as to their purity and potency and as to whether or not the products are correctly labeled as required by the law and regulations. Viruses, serums, toxins, etc., imported from foreign countries, are refused entry by collectors of customs unless prepared in an establishment holding a license or unless intended for experimental purposes.

The results of the examination of the samples obtained by the inspector and forwarded to the laboratory for examination and his report of the inspection form the basis of recommendations for or against the issuance of a license to that particular establishment. The inspector's report, together with the results from the laboratory, are considered by the sanitary board of the Public Health Service, which makes recommendations to the Surgeon-General as to whether a license shall or shall not be granted. In the event that a license is granted by the Secretary of the Treasury it is for a particular product and no general licenses are given for the manufacture of biologic products; but each vaccine, serum, toxin or similar product is considered separately.

After a firm has been licensed to engage in the manufacture and interstate sale of these products, samples are purchased on the market at frequent intervals in various parts of the country and forwarded to the Hygienic Laboratory, where they are examined, first, as to labeling; second, as to the potency of products for which standards have been adopted; third, as to sterility and freedom from toxic properties not inherent in the product itself; and, fourth, as to the amount of preservative. In certain instances they are also examined to determine their harmlessness to healthy individuals. If the samples are found to be deficient in any of the above named points, the matter is at once reported by the laboratory to the Surgeon-General of the Public Health Service, who, in the case of a lack of potency, contamination or excessive amount of preservative, may require the manufacturer to withdraw from the market all of that particular lot of serum that remains unsold. This is not a difficult thing to do, as manufacturers are required to label each lot with a laboratory number and to keep records as to whom the serum has been sold. When an infringement of the law or regulations has been discovered during inspection or by laboratory examination, the Surgeon-General recommends to the Secretary of the Treasury that the license of the offending establishment be suspended; and, if the conditions are not corrected within sixty days after suspension, he recommends that the license be revoked and the facts as to the cause of suspension and revocation of license may be published in a circular letter issued by the Secretary of the Treasury.

LICENSE NOT A GUARANTEE OF THERAPEUTIC VALUE

The fact that a firm is licensed to manufacture and sell in interstate trade a virus, serum or similar product does not mean that the government recognizes such a product as valuable for curative or prophylactic purposes. In fact, as pointed out above, under existing law the product may have little or no therapeutic value. Except for certain products for which standards have been established, such as diphtheria and tetanus antitoxins and the potency of vaccine virus, no potency requirements are enforced. In other words, the license to make and sell a product in interstate traffic does not carry a governmental guarantee of its therapeutic efficiency; it simply means that this product has been examined to see that it is truthfully labeled in that it contains the manufacturer's name, the license number and an exchange date, and that it is free from bacterial or toxic properties not inherent in the product itself. For example, some firms are licensed to sell normal horse-serum provided it is so labeled and is free from impurities; also, there are certain serums, such as antityphoid serum, antipneumonia serum and others of like doubtful efficacy, and still other serums or products in the experimental stage of development, which are sold under a license; but the license to sell these products does not mean that the government in any way endorses the present or prospective therapeutic value of the products. This brings up an important question in regard to this class of unknown or experimental preparations. There is no authority for a satisfactory control over these kinds of products at present, and efforts should be made to obtain legislation giving such authority and also giving additional facilities and money for a more strict laboratory supervision, so that we may at least know if they have an experimental basis for their use, or even if they are what they claim to be.

BENEFITS DERIVED

Some of the advantages so far secured in the control of these products by the Public Health Service may be summarized as follows:

1. All manufacturers have been required to put their stables, barns and laboratories in good sanitary condition and to keep them so.
2. When work with tetanus, tuberculosis, etc., is done in laboratories producing diphtheria antitoxin, a complete separation of such work is required.
3. All establishments are required to be equipped with proper laboratory facilities and personnel to insure the safe and efficient preparation of the several products for which a license has been granted.
4. Each lot of vaccine virus is required to be examined, bacteriologically, and a special test made for tetanus bacilli, and detailed records kept of such examinations.
5. The sale of the old style "dry" lymph points is no longer allowed.
6. All animals used for the propagation of vaccine virus are required to be necropsied and the virus from any animals proved to be suffering from a communicable disease other than vaccinia is not allowed to be sold.
7. All serums are now required, in addition to tests for potency, where standards are established, to be examined for and to be found free from bacterial and toxic contamination; to be correctly labeled; to state the date beyond which they cannot be expected to yield their specific effects, and to contain no excessive amount of preservative.
8. Standards for diphtheria and tetanus antitoxins having been established, physicians have a knowledge of the exact amount of the dose used in each instance.
9. A standard for tetanus antitoxin having been established, it is now possible to use known and comparable amounts of the particular make of serum, and thus valuable data may be gathered as to the amount of tetanus antitoxin needed for prophylactic and curative purposes.
10. When the physician uses a package of diphtheria or tetanus antitoxin he may feel assured that every known safeguard has been thrown about its production and that it contains at least the number of antitoxic units stated on the label.

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ANTISTREPTOCOCCUS SERUM[*]

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In the protection of the animal body against virulent streptococci two factors are known to be of importance. The bacteria are first acted on by opsonin, which is found especially in the blood-serum, and thus prepared for phagocytosis by the leukocytes in which they are destroyed. The normal body usually possesses sufficient antistreptococcic power for its protection against streptococci as they occur on the mucous membranes, tonsils, etc. If the normal resistance is lowered, or an unusual number or highly virulent bacteria gain entrance to the body through some defect in the protective mechanism, the bacteria may multiply and produce disease. When such an infection runs a favorable course the streptococci stimulate the body cells to produce immune opsonin which in turn acts on the streptococci and prepares them for phagocytosis and destruction by the leukocytes. A coincident increase of leukocytes also heightens the power of the body to destroy the invading bacteria. While phagocytosis, following on efficient opsonification, explains the elimination of infecting streptococci, it does not, however, make plain the mechanism by which the toxic effects of the bacteria are overcome. We know but little of the essential composition and action of the so-called endotoxins of streptococci or of the ways in which they are neutralized in the body.

Since living streptococci during the course of an infection stimulate the production of immune opsonin, Nature may be assisted by injecting the bodies of streptococci which have been killed in various ways with the object of calling forth a similar result without the danger of a fatal infection. Dead bacteria have been found to act in a manner similar to the living and on this principle the vaccine treatment of streptococcus infections has been built. Immunity induced in the individual animal by viously employed in immunization work, that is, the preparation of a serum by the inoculation of a number of different races of pneumococci, hoping thus to prepare a polyvalent serum efficacious against practically all the races likely to be encountered. This has seemed to me a crude method of dealing with the problem and one not likely to advance our knowledge of the exact conditions concerned.

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[*] Read in the symposium on Serums and Vaccines at the joint meeting of the Sections on Pharmacology and Practice of Medicine of the American Medical Association at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

[*] From the Memorial Institute for Infectious Diseases, Chicago.

Without going into the details of the methods which have been described elsewhere by Dochez, it may be stated that the pneumococci isolated from cases of pneumonia which I have studied may be divided into four groups. The organisms belonging to each of the first two groups are specific, so far as their immune reactions are concerned. An immune serum produced by the injection of a horse with a race belonging to Group 1 has a specific action against all the members of Group 1, but has no effect on the organisms of any of the other groups. In like manner, an immune serum produced by the injection of a horse with a pneumococcus belonging to Group 2 is protective against all the other members of this group, but has no effect against the members of any of the other groups. In Group 3 are included the organisms of the so-called *Pneumococcus mucosus* type. These organisms have very large capsules and produce a sticky exudate in animals. So far it has not been possible to produce an active immune serum against this variety, though an effective active immunity may be obtained. An immune serum produced by a member of any of the other groups has no protective power for any race of this group. In Group 4 are included all the races against which Serums 1 and 2 are not effective and which, from their other properties, do not belong in Group 3. Animals may readily be immunized to any member of this group, and the serum of the immunized animal is protective against the race used for immunization. In no instance, however, has this serum been found effective against any other race of this group or against the organisms of the other groups. So far as cultural and morphologic characters are concerned, no constant group differences have been discovered between the members of Groups 1, 2 and 4. By means of the agglutination reaction of the various races, however, it has been found possible to group them in exactly the same manner as by protection experiments.

It has become evident, therefore, that while a large majority of cases of pneumonia are due to pneumococcus, so far as immune reactions are concerned the cases of pneumococcus pneumonia are caused by organisms of at least four different types, and, from the point of view of specific therapy, this is equivalent to saying that they are due to at least four organisms. In seventy-four cases of pneumonia studied the number of cases found to be due to organisms belonging to each of four groups is shown in Table 1.

TABLE 1.—CLASSIFICATION OF SEVENTY-FOUR CASES OF PNEUMONIA

Type of Organism	Number of Cases	Percentage
1	35	47
2	13	18
3 (mucosus)	10	13
4 (heterogeneous)	16	22

It is now evident that in studying the effect of an immune serum on patients with pneumonia, but slight conclusions can be drawn from its indiscriminate employment in all cases. First, we must know the type of organism used for its production, and second, it must be employed only in cases due to organisms of this type. So far, it has been possible to produce a serum of high protective power against organisms of Type 1, and a second serum, only slightly less efficacious, against organisms of Type 2. As previously stated, it has been impossible to produce a serum active against organisms of Type 3. To produce a serum active against organisms of Type 4, it would be necessary to immunize an animal against every obtainable race of this group. This would not be practicable. So far as the treatment of pneumonia is concerned, however, this is of minor importance, since our observations indicate that pneumonia due to organisms of Type 4 is of relatively slight severity, and most of the patients recover without any specific treatment. This is shown in Table 2.

TABLE 2.—MORTALITY

Cases Due to	No. Patients	Died	Per Cent.
Type 1	34	8	24
Type 2	13	8	61
Type 3	10	6	60
Type 4	15	1	7
Total	72	23	32

At present, therefore, the problem has resolved itself into treating the cases of pneumonia due to organisms of Type 1 and Type 2 with Serum 1 and Serum 2. In order to treat the individual case, however, it is necessary to have a method of determining very promptly, after the patient comes under observation, the type of organism concerned. It has been found possible to do this by using the following method: When a patient with pneumonia is admitted to the hospital, a culture is immediately made from the blood and also one from a portion of sputum coughed up from the lung, or, when this is not obtainable, a culture is made directly from the lung by the insertion of a needle. This procedure seems to be without danger. When there are large numbers of virulent organisms in the sputum, a culture may be most rapidly obtained by injecting the sputum into the abdominal cavity of a mouse. After four or five hours the peritoneal cavity may be washed out with salt solution and the cells thrown down in the centrifuge; a suspension of the organisms is thus obtained. However the culture is obtained, the agglutination test is at once applied. If the organism fails to agglutinate with either Serum 1 or Serum 2, it is, of course, useless to undertake serum treatment. If, however, one of the serums agglutinates the organism, treatment may be commenced at once with the appropriate serum. Later the organisms have been studied by testing the protective power of the serum, and in all cases the protection test has corresponded with the agglutination test.

We have now shown certain reasons why the use of immune serum in the past has not been efficacious, and methods have been described whereby, theoretically at least, such serum may be rendered effective. It may be assumed that given serums of high protective power against organisms of Groups 1 and 2, the early determination of the nature of the infecting organism and the early administration of large doses of the appropriate serum should have a favorable influence on the course of the disease. So far it has been possible to test this assumption on only a comparatively small number of cases, since the work so far has been largely preliminary and done with a view to establishing the practical application of the serum on a sound experimental basis.

Serum has now been administered in twenty cases of pneumonia. In one of the first cases a further study of the organism showed it to be of Type 4, so the use of serum was discontinued. In two cases the patients were admitted in the last stages of the disease and the serum was administered only a few hours before the patients died. Seventeen cases have therefore been treated with the serum. Of these, fourteen were due to organisms of Type 1 and three to organisms of Type 2.

The method of administration of the serum was as follows: On admission, 2 c.c. of serum were injected subcutaneously to discover if the patient was hypersensitive. As soon as the type of organism was determined, from 50 to 100 c.c. of the serum, diluted one-half with salt solution, were injected intravenously. The condition of the patient served as a guide in the later treatment. Usually the serum was not administered oftener than every twelve hours. The patients treated received totals of from 190 to 460 c.c. of serum, except one, who received a total of 700 c.c. of serum. Treatment was commenced on the third day in six cases, the fourth day in four cases, the fifth day in three cases and the sixth day in four cases.

The patients treated were all seriously ill, the most severe cases we have had during the winter. In the fourteen cases due to Pneumococcus 1, all of the patients recovered but one, and in the three cases due to Type 2, one patient died. This patient, however, objected to the treatment and would not allow its continuation, so it was not thoroughly carried out. When we consider that the mortality among the cases due to Types 1 and 2 is very high, the result is certainly not discouraging. The number of cases is much too small, however, for any conclusions to be drawn from the results as regards mortality.

At present conclusions as to the efficacy of the serum must be based on other criteria. Let us first consider the effect on the clinical course of the disease. Temperature curves are not here presented, since erroneous conclusions may be drawn unless all the curves are presented, and in the present instance this is impossible. Following practically all the injections, a reaction has occurred. The temperature usually rises, and then falls, but does not necessarily remain low. In two instances the rise of temperature has been marked. In the other cases the rise of temperature following the injection was only a degree or so. In all the cases except the fatal ones, the serum has apparently had an ultimate favorable effect in lowering the temperature and shortening the course of the disease, though, of course, this is a very difficult matter of which to be absolutely sure. In no case was one injection of the serum sufficient to bring on a crisis. All the patients seemed to feel better following the injection of the serum, and in a number of cases the apparent lessening in the degree of intoxication was very manifest.

When the treatment was commenced early, no extension of the involvement of the lung occurred. On the other hand, however, there was no special tendency in the treated cases for the lung lesion to resolve rapidly. If anything, there seemed to be a tendency for resolution to be delayed in these cases. This has been noted by others in certain cases treated by serum. One of the patients developed a pneumothorax with empyema. Operation was performed and recovery ensued. Fortunately, this was not one of the patients in whom the lung was punctured for culture. Three patients later developed signs of fluid, and aspiration of small amounts of fluid was performed. The fluid in these cases was sterile and operation was not necessary.

More important than the foregoing criteria, however, in indicating an effect of the serum, are the following observations, since they have depended solely on objective procedures: First to be mentioned is the effect of the serum on the organisms in the blood. In eight cases pneumococci were isolated from the blood before the treatment was commenced. In all cases blood-cultures were made before each treatment, and in all of these cases after one treatment and before the second (or within from eight to twelve hours) the blood had become sterile. The conclusion seems justified, therefore, that one large dose of active serum given intravenously is sufficient to sterilize the blood. It also seems certain that if the organisms are not present in the blood, the administration of the serum will prevent their invasion.

Second, in a previous study of the protective substances in the blood-serum of patients with pneumonia,[3] it has been shown that, as a rule, the appearance of protective substances in the blood, when demonstrable, coincides rather sharply with the period of critical fall in temperature and the disappearance of symptoms. Before the crisis they are not present in the blood in any measurable degree.

A similar study has been made by Dochez of the protective substances in the serum in a number of the cases of pneumonia treated with serum. In all the cases studied, it has been possible to demonstrate the appearance of such substances in considerable amounts in the serum very shortly following the administration of one dose of the immune serum, even when this serum has been administered early in the disease, at a period when such protective substances are otherwise never present. These substances persist, and in case they play a part in the mechanism of recovery, as was concluded from the previous study, it is evident that their appearance indicates a favorable action of the immune serum.

The results obtained, therefore, from the clinical and laboratory study of this series of cases of pneumonia treated by the injection of large amounts of appropriate serum, seems to indicate that a method has been devised for the successful specific treatment of at least a portion of the cases of acute lobar pneumonia.

The mode of action of immune serum in these cases is still obscure. We have found no evidence of a bactericidal action of this serum, either *in vitro* or *in vivo*. The evidence that the effect is due, to any considerable degree, to the presence of bacteriotropic or opsonic substances is still inconclusive. The effect on the patients seems to indicate that the effect to some extent, at least, may be due to the presence of antitoxic substances. Until the toxin responsible for the symptoms in pneumonia is isolated, however, the final proof of antitoxic action cannot be demonstrated. It has been shown,[4] however, that when living pneumococci are dissolved in bile, the resulting solution, when injected into rabbits and guinea-pigs, is very toxic. By means of experiments on animals, which will be reported elsewhere, it has been possible to demonstrate that the toxic action of such an extract may be neutralized by the addition of proper amounts of the corresponding immune serum. Such extracts have also been found to be lytic for red blood-corpuscles, and it has been possible to inhibit this lytic effect by means of the corresponding immune serum. It is therefore evident that in case this toxin plays a rôle in the symptoms of this disease, the action of the serum in man may be due, in part at least, to its antitoxic properties.

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[3] Dochez, A. R.: The Presence of Protective Substances in Human Serum During Lobar Pneumonia, Jour. Exper. Med., 1912, xvi, 665, abstr., THE JOURNAL A. M. A., Dec. 7, 1912, p. 2094.

[4] Cole, Rufus: Toxic Substances Produced by Pneumococcus, Jour. Exper. Med., 1912, xvi, 644, abstr., THE JOURNAL A. M. A., Dec. 7, 1912, p. 2094.

SUMMARY

Antipneumococcus serum, in order to be effective, must be given early, in large amounts. Since pneumococci, so far as their immunologic properties are concerned, are divided into distinct groups, it is necessary in any case to administer the serum active against the group to which the organism infecting this case belongs. Highly active serums against two groups of pneumococci have been obtained, and treatment has been carried out in a small number of cases. The effect in these cases has been favorable and the mortality has been very low. In judging of the value of the serums, however, other facts are considered of more importance; namely, first, that bacteria in the blood are destroyed, and second, that immune substances, which ordinarily appear in the blood about the time of crisis, appear in the treated cases very soon after the administration of the serum. Lastly, there is some experimental evidence that part of the action of the immune serum may be antitoxic.

Sixty-Sixth Street and Avenue A.

PROGRESS IN ANTITYPHOID VACCINATION DURING 1912 *

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Not until the close of the past year, 1912, has it been possible to know how much protection can be obtained from the use of antityphoid vaccine when administered to a large number of men of susceptible age. In the latter part of 1911 the use of antityphoid vaccine was made compulsory for all men in the service under 45 years of age, and as a result we now have records for the year 1912 covering approximately 85,000 vaccinated men. Of these 58,000 were stationed in the United States proper and the remainder in the colonies.

TABLE 1.—TYPHOID FEVER—UNITED STATES—ENLISTED AMERICAN TROOPS

Year	Mean Strength	Absolute Cases	No. of Deaths	To Each 1,000 Soldiers, of the Command, the Ratios Are For Cases	For Deaths
1901	26,515	250	17	9.43	.64
1902	39,736	341	34	8.58	.86
1903	42.264	246	12	5.82	.28
1904	43,940	247	12	5.62	.27
1905	42,834	153	13	3.57	.30
1906	40,621	230	12	5.66	.28
1907	35,132	124	7	3.53	.19
1908	46,316	136	11	2.94	.23
1909	57,124	173	16	3.03	.28
1910	55,680	129	9	2.32	.16
1911	55,240	44	6	0.80	.11
1912	58,119	15	2	0.26	.03

Table 1 shows the typhoid experience of troops in the United States for the past eleven years; the average strength of the home army, the number of cases and deaths are given, and also the morbidity and mortality per thousand of mean strength.

To elucidate this and the following tables the following data are furnished: Voluntary vaccination was begun in March, 1909, and 830 men were vaccinated during that year; too small a number—the strength of the army considered being 57,124—to influence the ratios. In 1910 a much larger number, 16,093, were immunized, and some effect on the morbidity and mortality rates became apparent, both being the lowest ever recorded in the medical history of the Army. In 1911, however, prophylactic immunization was even more generally used. Up to March it was entirely voluntary, but during that month was made compulsory for the Maneuver Division, about 20,000 men, assembled in Texas and along the Mexican border. In June the order was extended to all recruits, from 2,000 to 3,000 per month, since which time all recruits have been given the initial dose of typhoid vaccine as well as small-pox vaccination on the first day of service. The last and most important step was the extension of compulsory vaccination to all persons in the military service under 45 years of age, and this was made in the last quarter of 1911. The full effect of antityphoid vaccination was not, however, apparent until recently, when the statistics for 1912 were compiled.

TABLE 2.—TYPHOID, CASES, DEATHS, ETC.—OFFICERS AND MEN—UNITED STATES PROPER

Year	Total Cases	Total Deaths	Infected Prior to Enlistment	Among the Vaccinated No. of Cases	No. of Deaths
1909	170	16	?	1	0
1910	139	10	?	4	0
1911	44	6	?	7	0
1912	18	3	5	6	0

Table 2 covers only the period during which vaccine has been used, and differs from Table 1 in including officers with the enlisted men. It also shows the number, during 1912, who developed the fever before immunization could be carried out, patients undoubtedly infected before enlistment; in addition, the number of cases occurring each year among the vaccinated is stated.

TABLE 3.—TYPHOID, 1901-1912, FOR THE WHOLE ARMY, AT HOME AND ABROAD—OFFICERS AND ENLISTED MEN

		Cases		Deaths			Occurring Among Those Who Were Vaccinated	
Year	Mean Strength	Number of	Ratios per 1,000 of Mean Strength	Number of	Ratios per 1,000 of Mean Strength	Per Cent. of Total Cases	Cases	Deaths
1901	81,885	552	6.74	74	.88	13.0	..	..
1902	80,778	565	6.99	69	.85	12.2	..	..
1903	67,643	348	5.14	30	.44	8.6	..	..
1904	67,311	293	4.35	23	.33	7.8	..	..
1905	65,688	206	3.14	20	.30	9.7	..	..
1906	65,159	373	5.72	18	.27	4.8	..	..
1907	62,523	237	3.79	19	.30	8.0	..	..
1908	74,692	239	3.20	24	.31	10.0	..	..
1909	84,077	282	3.35	22	.26	7.8	1	0
1910	81,434	198	2.43	14	.17	7.1	7	0
1911	82,802	70	.85	8	.10	11.4	11	1
1912	88,478	27	.31	4	.044	14.8	8	0

The use of the typhoid prophylactic has not, however, been confined to the continental limits of the United States, but has been used also in Porto Rico, Panama, Alaska, Hawaii, the Philippines and China. Table 3 gives the typhoid experience for the entire army, at home and abroad, officers and enlisted men, for the past eleven years, the same period covered by Table 1.

It will be noticed that the lowest death-rate attained previously to the introduction of vaccination was 27 per hundred thousand in 1906, and the lowest morbidity was 320 per hundred thousand in 1908. From these two low points, the best ever attained under sanitary measures alone, the rates have fallen precipitously to 4.4 and 31 per hundred thousand, respectively. In 1912 the number of cases in the entire service was reduced to one-tenth and the number of deaths to one-sixth of the best record before vaccination, and for many reasons this radical reduction in our rates can be shown to be due to the typhoid prophylactic.

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* Read in the Symposium on Serums and Vaccines at the joint meeting of the Sections on Pharmacology and Practice of Medicine of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

Charts 1 and 2 express graphically the morbidity and mortality rates given in Table 1, and the parallelism shows quite clearly that the improvement is not confined to cases only, but is equally evident in the number of deaths, about which there can be no doubt or question as to the diagnosis.

Chart 3 is a graphic chart of the non-effective rate for typhoid and paratyphoid for ten years. This ratio is a true measure of the amount of sickness in the Army from these two diseases; it shows the number of days lost per thousand men of average strength for the year, including both days spent in hospital and those spent in quarters or on leave of absence during the period of convalescence, and it shows very clearly the great gain in efficiency since the introduction of vaccination; the lowest non-effective rate previously to vaccination was ten times the rate for 1912. A study of this chart alone should carry conviction to any contractor or large employer of labor or to any one responsible for the health of many persons, such as educators and the superintendents of large institutions.

The question of correct diagnosis is one which merits consideration; it is conceivable that some mild cases of typhoid fever might masquerade under other names and, to a certain extent, vitiate the statistics. For this reason a study has been made of the rates for malaria and undetermined fevers in comparison with typhoid, and the study shows a diminution of all three; it is therefore clear that no appreciable number of cases of typhoid have masqueraded under these heads.

It is still too early to obtain complete records for any part of 1913, but reports for the first five months have been received from all posts in the United States and they are given in Table 4, in comparison with those of previous years. The last case of typhoid in the Army occurred Dec. 19, 1912, in an unvaccinated man.

The significance of a statistical table is not readily apparent without comparison with familiar facts, and for this reason Table 5, comparing typhoid death-rates in the army with those in civil life, has been prepared.

It is interesting to note that even before the introduction of vaccination there was less typhoid in the Army, as a rule, than among the civil population of the registration area. In eight of the past ten years the Army rate has been lower than the civil, and during the past three years, that is, since antityphoid vaccination has been used at all extensively, it has been very much lower; and this is true notwithstanding the considerable and progressive decrease in the civil rate, which, for 1911, was the lowest yet recorded by the Census Bureau.

In a recent issue of The Journal,[1] can be found the typhoid rates for the larger cities of the United States, and it will be seen that in only one (Cambridge, Mass.) was the 1912 rate lower (2.8) than for the Army. The thought readily suggests itself that extensive use of vaccine in civil life would bring about a corresponding improvement.

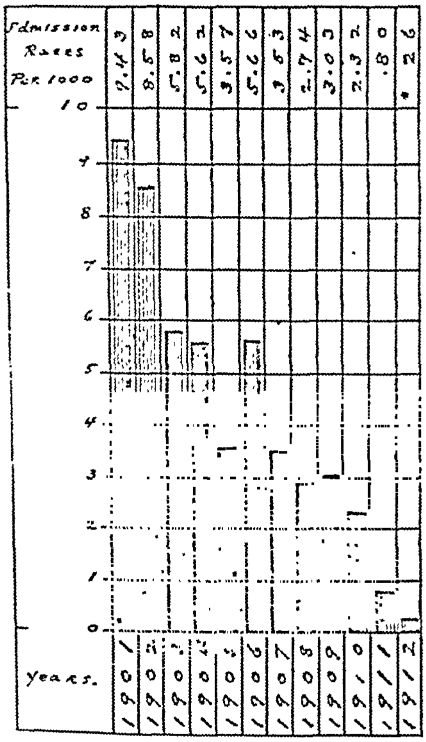

Chart 1.—Admission rates for typhoid. United States (enlisted men).

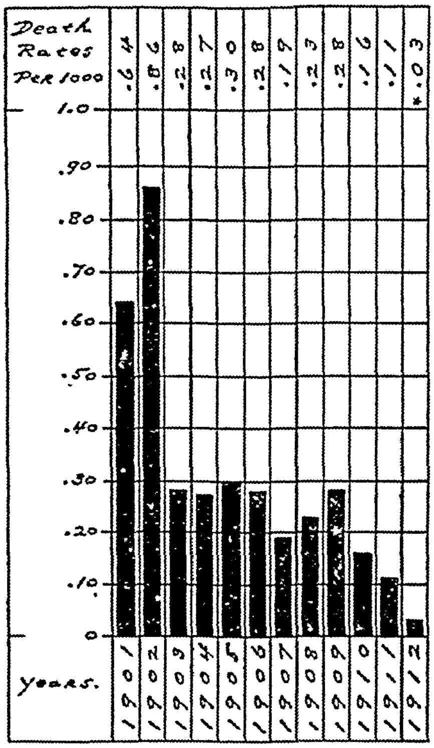

Chart 2.—Death-rates for typhoid. United States (enlisted men).

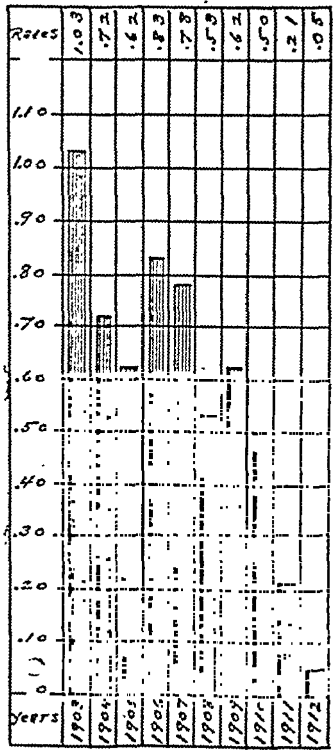

Chart 3.—Non-effective rates for typhoid for the Army—officers, American troops, Porto Ricans and Philippine scouts; includes paratyphoid.

The duration of the immunity obtained from the vaccine used in our service remains unknown. The idea that it lasted only so long as agglutinins or other antibodies were demonstrable in the blood-serum was, of course, untenable, since we know that following an attack of typhoid fever agglutinins cannot be detected for more than a few months, yet the immunity remains, as a rule, for life. Immunity after vaccination among English troops in India[2] does not appear to last over thirty months, but for various reasons we expect, and are obtaining, a longer period of immunity. Definite deductions, however, cannot yet be made because of the comparatively small number of men inoculated during the first two years. Another obstacle is the occurrence of an unknown number of cases of paratyphoid fever, clinically indistinguishable from typhoid itself. We now know that such cases cannot be correctly diagnosed by agglutination reactions alone, since these are frequently misleading, but that blood-cultures are necessary. Until paratyphoids are correctly diagnosed and excluded from the tables, it will be impossible to know the exact limit of immunity. It, no doubt, diminishes gradually, as after vaccination against small-pox; and the practice has been adopted of revaccinating against both typhoid and small-pox at the beginning of each four-year period of enlistment in the Army. This is done, not because there is good evidence that the immunity has all disappeared, but for the reason that it does not seem wise at present to trust to anything less than the maximum immunity obtainable.

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[1] Typhoid in the Large Cities of the United States, special article, The Journal A. M. A., May 31, 1913, p. 1702.

[2] Firth: Jour. Roy. Army Med. Corps, 1911, xvi, 589.

The Army is as well protected against small-pox as repeated vaccination can make it, and for this reason it is interesting to compare the results obtained by vaccination against these two diseases. During the past four years vaccination against small-pox has failed in conferring absolute protection against infection in fifty-three instances, one of which was fatal; during the same period, although among a smaller number of men, antityphoid vaccination has failed only twenty-seven times, with one fatality from hemorrhage. The absolute numbers are given in Table 6.

TABLE 4.—TYPHOID CASES—UNITED STATES—OFFICERS AND ELISTED MEN—U. S. ARMY*

Years	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total First 7 Months
1908	5	6	4	2	3	11	14	31	25	26	12	8	45
1909	4	10	6	4	11	15	26	14	16	45	20	6	76
1910	8	11	1	4	2	6	12	27	21	16	20	11	44
1911	3	3	3	7	4	4	4	7	4	4	1	0	28
1912	1	2	2	0	0	3	1	4	1	4	0	1	9
1913	0	0	0	0	0	..	..	..	..	..	..	..	0

*Paratyphoid fever included in figures for 1908, but excluded in other years. Cases of paratyphoid: 1909, 3; 1910, 3; 1911, 2; 1912, 3; 1913 to date, 0.

The immediate results of vaccination have been described in former articles and will not be referred to further. During the past four years over 200,000 persons, mostly in the military or naval services, have been immunized without any fatalities or untoward results. There have been no reports of cases indicating that the vaccination has activated latent tuberculosis or any other disease; in fact, as regards tuberculosis, there has actually been a diminution in the number of cases of all classes of tuberculosis during this period.

TABLE 5.—DEATH-RATES PER ONE HUNDRED THOUSAND POPULATION

Year	Army United States Proper	Registration Area U. S. Census
1903	28.0	34.1
1904	27.0	31.7
1905	30.0	27.8
1906	23.0	31.3
1907	19.0	29.5
1908	22.0	24.3
1909	28.0	21.1
1910	16.0	23.5
1911	11.0	21.0
1912	3.0	?

We make it a rule to vaccinate the healthy only, and any febrile illness, whatever its nature, automatically postpones vaccination. It is perhaps to this precaution that we owe our freedom from bad results.

The practice of antityphoid vaccination has been a pronounced success in the military and naval services, in hospitals, schools, institutions and in the camps of pleasure-seekers and contractors; in fact, wherever in military and civil life it has been used. We feel that its more general use, especially among the young, is advisable. The fact that it occasionally fails to confer complete protection is not a valid objection to its use, but rather an indication for its repetition at intervals to be determined in the future. A practical program is easily formulated on the following basis: No prophylactic vaccination is needed by persons living in a city or country district in which the typhoid rate is continuously low. If, however, a person, young or adult, leaves such a region for one in which the typhoid rate is high or the chances of exposure greater than at home, vaccination is indicated. It is, of course, indicated in cities or country districts with high typhoid morbidity. Revaccinations may be managed after the pain used in vaccination against small-pox, that is, in childhood, youth, and again when exposure threatens.

TABLE 6.—COMPARISON OF SMALL-POX AND TYPHOID VACCINATION—ENTIRE ARMY—OFFICERS AND ENLISTED MEN

	Small-pox			Typhoid		
Year	Number Vaccinated	Cases	Deaths	Number Vaccinated	Cases	Deaths
1909	74,692	7	0	830	1	0
1910	81,434	17	1	16,093	7	0
1911	82,802	20	0	30,000?	11	1
1912	88,478	9	0	88,478	8	0
Totals		53	1	......	27	1

It will certainly be as efficacious in civil life as in the Army, and its more general use will hasten the time when typhoid fever will become a negligible factor in our public-health problems.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. ANDERSON, COLE, WEAVER AND RUSSELL

Dr. Joseph L. Miller, Chicago: In the study of the various phases of disease there is none which probably offers so many difficulties as the study of the value of therapeutic measures; and in the study of the value of therapeutic measures there is no class of diseases so difficult as the acute infections, because they are largely diseases which have a self-limited course and in which there is a large percentage of spontaneous recoveries and a great variance in different epidemics, as well as in the intensity of the infection in individual cases. It, therefore, becomes necessary that the person undertaking the study of any therapeutic agent shall have had either a wide experience in the study of the diseases in which he has kept careful individual data, or else a suitable number of control cases. In a study of this character it is well for us to draw a sharp line of distinction between medical impressions and medical facts. The papers to which we have listened to-day are of especial interest and value because they deal with facts, not with medical impressions.

Dr. Walter V. Brem, Los Angeles: Advantage ought to be taken of this time to speak of those doubtful laboratory products the exploitation of which has so confused the minds of many of the men in the profession recently and against which the government is at present unable to protect us.

The first of these is Phylacogen, or Schaefer's Vaccines. Some time ago I attended a meeting in southern California at which Dr. Schaefer read a paper. He stated that he had treated a case of tuberculous meningitis with tubercle Phylacogen. He thought that the evidence that this case was tuberculous meningitis was complete because he had a spinal fluid in which the mononuclear cells were increased and in which the acid-fast bacilli were found. He said also that the Nonné test for globulin was absent. In the discussion I asked him if animals had been inoculated; he said they had not. He was much surprised that I would not accept the case, without animal inoculation, as a case of tuberculous meningitis. He reported that the patient had reached a normal temperature, with relaxation of the muscles of the neck and disappearance of other symptoms by the end of three days, after three injections of Phylacogen, and that six weeks after treatment had been begun the man was attending to his business regularly.

In the further discussion I pointed out that we had not been given reports from men whom we knew as to the action of Phylacogen. I said that we should have had such reports before the Phylacogens were put on the market. I was told that Parke, Davis & Co. had put Phylacogens in the hands of seven hundred physicians, and that the reports from these physicians were obtainable or were available for inspection, in the files of the house. I replied that we did not want to go to a commercial house for our scientific data; that, so far as I could find, Dr. Schaefer himself had published only one report on the subject of Phylacogens, and that was in a journal said to be controlled by the commercial house selling the Phylacogens. I was able to find only two or three other reports in our medical literature, and these were of insufficient character, by men whom we did not know. I said that we wanted reports from authoritative sources in our own profession, from men whose observations we knew we could trust and who had no commercial axe to grind; men who have at heart the good of humanity.

It does seem to me now, however, that the immense sale of these Phylacogens and the number of people being experimented on demands that they be investigated by men equipped to carry out the investigations in a thorough way.

Dr. W. W. Tompkins, Charleston, W. Va.: I have seen three cases of rabies in the past twelve months, one in a man 69 years of age, another in a boy of 9 and a third in a girl of 5 years. I should like to ask one question in this connection: If a man who was bitten by a dog was presented for treatment, and the symptoms of rabies had developed, should he be informed that there is no authority for treating him, moreover that it would be ineffectual to give him any treatment?

About one-fourth of our population is colored, and these colored people, relatively speaking, are bitten much more frequently than are the white people, for they have more pet dogs than the white people have. I have never known one of these colored people to die of hydrophobia or rabies. Furthermore, in the cases that I have observed, those persons who were lacerated and badly torn have not developed the disease, and generally those who were just bitten slightly did develop it.

Every now and then we see or hear of cases of typhoid carriers like that of Typhoid Mary; I should like to ask Major Russell whether or not a carrier if injected with typhoid virus would cease to be able to communicate the disease.

Dr. H. S. Munro, Omaha: Nine-tenths of every patient's psychophysical potentialities are dormant and are utilized or available only when called into action by the influence of environmental stimuli. The nervous system not only acts, but it also reacts. It is the reaction that counts when a man is sick, and by suggestion we can heighten the resistive powers of the cells comprising the totality of the organism and augment the recovery of pneumonia patients. My success in the treatment of pneumonia has been in every way comparable with Major Russell's success with vaccine immunization for the prevention of typhoid. Nine of my twenty-two years in medicine were spent in general practice, and I had but a single death from pneumonia in patients above 2 years of age. This death occurred in a man of 68, who, following typhoid, had a pneumonia complicated by an enormous pleuritic effusion. I wish that other physicians would try out this method in the treatment of pneumonia and make a comparison of the results with those of vaccine treatment.

Dr. W. E. Scott, Adel, Iowa: I should like to ask Major Russell whether the tincture of iodin that is used in sterilizing the skin is freshly prepared, or whether something is added to it to prevent the changes due to age. It is known that destructive effects on the skin sometimes result from the use of old tincture of iodin, but I do not know how soon this change takes place.

Dr. Henry Hansen, Jacksonville, Fla.: I should like to ask Dr. Cole how he determines whether or not a patient will react with anaphylactic shock, how much serum is injected in order to determine that and also what time he has given for the symptoms to appear.

Dr. L. A. Knopf, New York: I should like to ask Dr. Russell if he has any suggestion to make as to how he can stop certain enterprises which claim to cure tuberculosis by atoxic living bacilli.

Dr. Van G. Yaeger, Hayward, Wis.: I should like to ask Major Russell why there is not more agitation for muzzling dogs to prevent rabies.

Dr. D. A. Herron, Comfrey, Minn.: I have read that one Dr. Allen, a former associate of Wright of London, recommends strongly the use of a standard vaccine, that is, a simple vaccine of pneumococci, in lobar pneumonia. Has Dr. Cole any opinion on the use of simple vaccines of pneumococci?

Dr. Rufus I. Cole, New York: We have made no extended test of the medical treatment outlined by Dr. Munro.

In order to determine whether or not the patient is sensitive to serum, we have, in every case, immediately on admission to the hospital, injected 2 c.c. of horse-serum and then continued our treatment as soon as we could determine the nature of the organism concerned. Possibly 2 c.c. is too large a dose. It may be thought better to use a much smaller amount. I know of diphtheria patients who have shown marked symptoms following the injection of 2 c.c. of serum. This will be a problem to be taken up later when we give the method of treatment wider application.

I have had no experience with the vaccine treatment of pneumonia.

Major Frederick F. Russell, Washington, D. C.: We have been unable to cure carriers with any vaccine which we have made. In regard to the treatment of typhoid patients by vaccine, we have had, for reasons which are evident, little material. Men I know have used typhoid vaccine in the treatment of cases, and some of them are quite optimistic; others are not. I myself have had almost no experience; what little I have had has been encouraging. The iodin used on the skin is the ordinary 7 per cent. tincture of iodin. Some use a 50 per cent. solution; others full strength; it is simply painted on the skin. We have never felt that prophylactic vaccination in the first stage of typhoid has done the typhoid patient any harm. We vaccinate a great many children; the dose is determined by weighing the child. The dose for an adult is based on an average of 150 pounds; if a child weighs 50 pounds, we give it a third; if the fraction does not come out conveniently, we increase rather than diminish the dose. Children do not react so strongly as adults; in fact, it seems to be a rule that the younger the person, the less the reaction.

Syphilis, "G.P.I.," and Tabes.—Another curious fact in favor of the syphilitic origin of tabes is, as was shown by Krafft-Ebing, that general paralytics are insusceptible to inoculation with the syphilitic virus. I do not know if the same has been proved in respect to tabes, but probably the result would be the same.—George Pernet, in *Clin. Jour.*, vol. 35, p. 374.

CHRONIC ARTHRITIS *

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DENVER

In announcing a series of articles on diseases of bones and joints the editor of one of our medical journals said recently that they would set forth "certain surgical methods quite different from those generally accepted." Therein he was in error, as no "generally accepted" surgical methods exist. The treatment seems largely a matter of temperament and environment. Especially is this true of chronic joint disease, and it will remain true so long as we depend for our inspiration on clinical experience. Clinical experience always has failed us in advancing our knowledge, and it will fail us here. We have still much to learn, but we are picking our way slowly through the tangle. At present chronic arthritis falls to a great extent in the domain of the orthopedic surgeon, but the deeper I go into the subject, the more I am convinced that chronic arthritis must finally be handled by the internist. Some of the reasons for my belief will appear from what follows.

What I set forth is based on the laboratory study of about 120 specimens, as well as on clinical study.

CLASSIFICATION

All cases of chronic arthritis can be divided into two great classes or types. The second type includes such lesions as Heberden's *nodes and morbus coxae senilis*, and, on account of lack of time, will not be discussed here. The other type includes by *far the greater number* of all cases of chronic joint disease. Its chief characteristic is a proliferative inflammation of the synovial membrane or of the lymphoid marrow or of both.[1] Depending entirely on the intensity and extent of this inflammation the bone and cartilage atrophy and disappear.

Mark well that the changes in the bone and cartilage are simply the result of the changes in the marrow and synovia.[2] There is nothing active about them.

PATHOLOGY

The changes in the synovia can be observed more easily than can those in the marrow. If the membrane be irritated, mechanically or otherwise, it undergoes a thickening and a villous proliferation. Its reaction is much the same, no matter what the nature of the irritant. Thus, if an inflamed joint be opened, the picture that presents is the same, whether the cause of the inflammation be syphilis, gonorrhea, typhoid, repeated mechanical injuries or a hemorrhage. Indeed, the gross changes wrought by tuberculosis are also the same, and we can only make the differentiation by demonstrating the tubercle. Further, the same morbid changes appear in the progressive multiarticular form of arthritis—the so-called "rheumatoid" arthritis,[3] Goldthwait's atrophic and infectious arthritis,[4] Nathan's metabolic arthritis,[5] Nichols and Richardson's proliferative form,[6] etc.

Let us turn now to the lymphoid marrow in the bone-ends. The characteristic change in the type under discussion is a chronic proliferative inflammation, which eats away the bone and cartilage, and, if severe enough, destroys the nutrition of both. The morbid process can reach the joint in one of two ways, by perforating the articular cartilage, or by entering the joint at its margin. The disease may exist indefinitely in the marrow, and possibly may never invade the joint cavity at all. In such case cultures from the joint would be negative.

The skiagram in all such cases, no matter what their cause, would show the same results, namely, a thinning and erosion of the cartilage, or its disappearance, and a rarefaction of the bone, possibly its partial destruction.

Pathologic identity implies identity of symptoms and of physical signs. In spite of all the clinical work that has been done on these joints, the various diseases which compose this type of arthritis cannot be differentiated from one another by their joint manifestations. If the patient were covered with a sheet, exposing the affected joint only, and if a history were denied us, we could not make a diagnosis as to the causal disease, even if an excellent skiagram were furnished for our inspection. In other words, as long as there is no sinus formation, the clinical picture may be the same in syphilitic, gonorrheal, typhoid, tuberculous, traumatic and hemorrhagic arthritis, and of that multiarticular progressive form which has passed hitherto under so many different names.

We have therefore, at least in the gross manifestations, pathologic identity, and identity of symptoms and of physical signs. How then can we make the diagnosis? Unless we can demonstrate the offending organism, only by considering circumstances outside the joint, and by weighing probabilities.

ETIOLOGY

We know that recurring trauma can produce the changes described, or some of them, and that the gonococcus, the *Spirochaeta pallida*, the tubercle bacillus and certain other germs can do the same. There remains that great group whose cause has never been absolutely demonstrated, although various observers have recovered pure cultures of cocci from the inflamed joints, and some have produced the disease by injection of these cultures into animals.[7] Shall we regard this group as "metabolic," or shall we believe that, after the manner of every non-traumatic chronic joint disease whose cause we have discovered, these cases also are due to micro-organisms?[8] Clinical evidence supports laboratory findings. Those who have searched diligently for a possible source of infection have often found it, and, removing it, have cured the patient.[9]

With clinical and pathologic evidence to support us then, we may adopt the working hypothesis that every non-traumatic chronic arthritis, like every non-traumatic acute arthritis, is due to an infection of the lymphoid marrow or of the synovia, or both.

SYMPTOMATOLOGY

The symptomatology of this type is comparatively simple in its essentials. The joint is usually swollen, and more or less painful and limited in its motion. Muscular atrophy may or may not be present. The joint may contain fluid or it may be a mass of fibrous adhesions. Constitutional symptoms, fever, etc., may be present or absent. Secondary infection may occur with any member of the group except the peculiar "cryptogenic form." A marked uniarticular nature is characteristic of some; a multiarticular of others. Certain others are sometimes uniarticular, sometimes multiarticular. There is no one symptom or group of symptoms peculiar to any member of the group, nothing that can be used to distinguish it from its fellows. The only way of making a positive diagnosis is by the demonstration of the causal organism or, in the case of tuberculosis, of the tubercle.

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* Read in the Section on Practice of Medicine of the American Medical Association, at the Sixty-Fourth Annual Session held at Minneapolis, June, 1913.

[1] The inner layer of the periosteum is regarded as being so much marrow, both in its function and in its reaction to disease.

[2] For a description of the morbid changes in arthritis see Ely, Am. Jour. Surg., 1912, March, et seq.

[3] Llewellyn, Jones: Arthritis Deformans, William Wood & Co., 1909.

[4] Goldthwait, Painter and Osgood: Diseases of the Bones and Joints, D. C. Heath & Co., 1909.

[5] Nathan, Philip W.: A New and Apparently Successful Method of Treating Metabolic Osteo-Arthritis, THE JOURNAL A. M. A., June 17, 1911, p. 1779.

[6] Nichols and Richardson: Jour. Med. Research, xxi, No. 2.

[7] Fayerweather: Am. Jour. Med. Sciences, 1905, cxxx, 165; Schüller; Berl. klin. Wchnschr., *1893*, xxx, 865; Poynton and Paine: Lancet, London, 1900, ii, 861, 932 and 1910, i, 1524.

[8] Adami defines health as metabolic equilibrium. Disease, then, is disturbed *metabolism.* Hence to say that an arthritis is due to disturbed metabolism is to say that it is due to disease.

[9] Billings, Frank: Chronic *Focal Infections and* Their Etiologic Relations to Arthritis and Nephritis, Arch. Int. Med., April, 1912, *p.* 484.

TREATMENT

If our hypothesis is correct, that every non-traumatic case in this type is infectious in its nature, the main indication for treatment is manifestly to find the focus of infection if we can, and to remove it. Local treatment occupies an entirely subordinate position except in tuberculosis. In tuberculosis local treatment is practically all we have to offer, always with the addition of general constitutional measures.

Chronic syphilitic arthritis, contrary to the teaching of most text-books, is by no means rare. Sometimes, when we are absolutely unable to find any definite source of infection, a course of anti-syphilitic treatment is advisable, on general principles. In my hands the iodids have proved of less service than mercury and salvarsan. Strangely enough immobilization seems absolutely useless in a syphilitic joint.

For a chronic gonorrheal arthritis the main indication is to set the genito-urinary tract in order. Until this be done all local treatment is simply palliative.

The progressive, multiarticular form has presented until recently a practically unsolvable problem, but the outlook now is by no means hopeless. He who writes off a prescription on the spur of the moment, or tries the latest panacea for joint diseases will continue to bemoan his results. Everyone of these cases furnishes a field for patient study, and the more thorough the study is, the more frequently a focus of infection will be found in some other lymphoid tissue of the body—a diseased tonsil, appendix, lymph-follicle or lymph-node. A suppurating tooth socket, nasal sinus or ear may be responsible, or a chronic intestinal infection, according to some authorities. In the last case we are on somewhat uncertain ground. Syphilis is almost certainly responsible for some cases. The tonsils should be removed as a routine measure, even when nothing points to their disease.

SUMMARY

The points which I wish to emphasize are: All the members of one great type of the chronic arthritides have a common symptomatology and practically a common pathology. With the exception of the traumatic cases, those whose nature is known are infectious in their origin. Those whose exact nature is still unknown are almost certainly infectious in their origin also. The treatment usually consists in removing the infection.

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ABSTRACT OF DISCUSSION

Dr. Richard C. Cabot, Boston: I want to ask Dr. Ely whether he has seen cures in any of these multiarticular cases of unknown origin by the removal of the focus of infection. We have for years been told to find these foci of infection, and many of us have tried to find them; often we do find them, but I have yet to see any cases improved.

Dr. Van G. Yeager, Hayward, Wis.: Dr. Ely recommended the removal of tonsils whether they were diseased or not. It has been said that rheumatic infections especially enter the body by way of the tonsils, but it has not been proved. Probably the tonsils filter out rheumatic organisms. If we remove the tonsils we simply remove the filter.

Dr. Joseph L. Miller, Chicago: Dr. Ely is touching directly on the etiology of these cases when he takes the stand that focal infections are responsible for practically all of these chronic joint infections. I believe that time will show that he is correct. I certainly have seen cases of chronic joint infections where the trouble has disappeared just as much as one could expect it to disappear from a joint in which there were more or less permanent anatomic changes. The stand he takes in regard to the appearance of the tonsil is of importance. A tonsil may appear to be perfectly normal; the patient may state that he has not had an attack of tonsillitis since childhood; still, when such a tonsil is enucleated, there may be found at its base an abscess, and cultures made from that abscess will show the presence of hemolytic streptococci. An injection of these cultures into rabbits will produce chronic arthritis. It has been my experience with many of those patients that after the removal of the tonsil the joint trouble disappears.

Dr. Collins Johnson, Grand Rapids, Mich.: May I ask Dr. Miller to tell us in what way the use of Phylacogen helped some of these chronic cases? A woman from Grand Rapids, after being treated unsuccessfully by a number of men in Grand Rapids, finally consulted Dr. Miller. She told me that he administered Phylacogen and sent her home well. I wish Dr. Miller would explain that.

Dr. Joseph L. Miller, Chicago: This lady to whom the doctor refers had an attack of tonsillitis in November. I saw her in June. She had had the tonsils enucleated immediately after that. She had arthritis in one hip; it continued. She had been treated by somebody at Johns Hopkins with vaccines. She was no better. She came to me with this story. I may say right here that when the Phylacogens were introduced, Dr. Schaefer used them in the County Hospital in a large number of acute infections, and I have seen results from Phylacogen in acute articular rheumatism which, I believe, have not deceived me. I am not advocating the way in which the Phylacogens have been promoted, nor am I supporting them at this time. I stated to this lady that she had had everything done for her rheumatism that I knew of, except the taking of Phylacogen, and that if she wanted to take them, I was willing to administer them to her. She said she was willing to take anything to get well. She took the Phylacogens, and as far as I know, she is well.

Dr. L. W. Ely, Denver: I have seen these joints cured by removing the source of infection. Do not understand me as saying that the tonsil is responsible for these joint infections in every case. There is no panacea for joint infections—no one organ that is responsible for all cases. One must examine the patient from head to foot, and then must try to decide on the guilty organ. In the present state of our knowledge it is a case of weighing *probabilities*. If one guesses the tonsil, one will strike it more often than in any other organ. I cannot answer the question as to how one knows that a tonsil is diseased; it is impossible to tell until the tonsil is removed; in fact, even then one cannot always tell.

I cannot speak about the filter action of the tonsil, because we know very little about that. We do not know what the function of the tonsil is as yet. But I do know, and I have proved it in my practice to a limited extent, that when the lymphoid tissue in the joint is *infected, the infection* usually comes from some other lymphoid tissue in the body. The work is based primarily on pathology, and clinical results confirm laboratory findings. You cannot cure your *patients' joint* absolutely, even when you take out the focus of infection, *if the joint tissues are destroyed*. If the cartilage is gone, the joint will never be movable *again* without an *operation*; but as to checking the disease, and, in the early cases, curing it by the removal of the infection, I know that it can be done, for I have done it.

HEMORRHAGE FROM THE NON-PREGNANT UTERUS *

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Even a casual glance over recent literature indicates that the subject of uterine hemorrhage is so complex as to make practically impossible a comprehensive classification of causes. At the same time, the subject is simple enough to be readily understood. Such confusion indicates ignorance of the underlying principles of menstruation—its anomalies and abnormalities. Without accurate knowledge of the regular menstrual function, attempts to treat departures from the normal must depend almost entirely on empiric rules, the result of experience in practice. Such clinical experience, in the treatment of the various forms of uterine hemorrhage, I may claim without unduly violating the canons of modesty. It is on the result of this experience that I wish to speak.

In practice one meets hemorrhage from the nonpregnant uterus during the three important epochs of a woman's life—puberty, the child-bearing period and the menopause. Whatever the time of life at which such bleeding occurs, it may be said to depend on either local or constitutional causes.

Under constitutional causes we may at present include those little understood forms of hemorrhage supposedly due to interference with or departure from the normal in the internal secretion or secretions of the ovary and other ductless glands. Such abnormality may be presumably in the quality, quantity or regularity of the secretion, but the bearing on treatment has not yet been determined.

Other better understood causes are chronic visceral diseases (heart, lung, liver and kidney), infectious fevers, syphilis, general arterial sclerosis with high blood-pressure, leukemia, hemophilia and essential anemias, including chlorosis.

In any given case of uterine hemorrhage without easily demonstrable local cause, these various factors should be ruled out before one resorts to the ubiquitous and overworked curet. Curettage in these cases is of no permanent value, although it may lessen temporarily the menorrhagia and metrorrhagia. Such improvement is, however, always transitory. It may be interesting to mention that Whitehouse reports 20 per cent. of failures in a large number of patients submitted to curettage, indicating that one woman in five has been subjected to operation unnecessarily—a strong indication against the prevalent methods in diagnosis and treatment of uterine abnormalities.

Treatment in cases of menstrual anomalies of constitutional origin resolves itself into treatment of the underlying causes. Menorrhagia and metrorrhagia are only two of the many local indications of a general condition which requires the adoption of proper hygienic and therapeutic measures for its relief or cure. The local symptoms require local treatment in very few cases.

There are certain cases, however, without demonstrable local or constitutional causes, which, for want of a better term, are usually considered cases of endometritis. Curettage cures them and the scrapings show the well-known appearance of hyperplasia and hypertrophy of the endometrium and its glands. It is very probable that a certain number of these cases arise as the result of a mild superficial infection, and this is especially to be considered if the patient also has leukorrhea.

Every method of diagnosis should be exhausted, including bacteriologic examination of the uterine cavity, before a patient is relegated to the class of those suffering with "simple endometritis"; and, for reasons to be considered later, girls during adolescence are never included in this class.

Local causes of uterine hemorrhage include practically every form of disease which may occur in the pelvis; infections of the uterus from gonorrhea or after puerperal sepsis, myoma, polyp and cancer, tears of the cervix, retrodisplacements, tubal, broad ligament, tubo-ovarian and ovarian disease. In this connection it must be remembered that bilateral ovarian tumors, particularly carcinoma, frequently cause amenorrhea as a result of complete destruction of ovarian tissue. Constipation is included among the local causes for the reason that it produces uterine congestion by mechanical obstruction to free venous flow from the pelvis.

Whether both local and constitutional causes produce hemorrhage by setting up a so-called endometritis or by their action on the vasomotor or muscular mechanism of the uterus, I am unable to say. Such hypertrophy and hyperplasia of the endometrium is almost always demonstrable in these cases, but it is also often present when there is no menstrual abnormality, and occasionally, in spite of the fact that there is free bleeding, atrophic instead of hypertrophic changes occur.

Whenever there is a demonstrable local cause for hemorrhage, such as lacerations, displacements, tumors, etc., treatment is simple and easily determined on. Indications for operation are obvious and the extent of the operation is determined by the amount of disease. In all cases in which the uterus is not to be removed, curettage should always be performed, as this hastens the return to normal. These easily recognized and treated forms of hemorrhage occur with greatest frequency during the child-bearing period and a large number of them are a direct result of parturition.

Puberty and the menopause furnish us with the most difficult and puzzling forms of hemorrhage and the ones which are at the same time the most resistant to treatment.

The onset of the menstrual cycle is a critical period in a girl's life, when her nervous and bodily functions are readily and perhaps permanently unbalanced. The greatest care is necessary in the treatment of any abnormalities of sexual organs, as nervous shocks of any kind are likely to develop a morbid mental attitude toward the menstrual and sexual life. Pelvic examinations and local treatment can and should be avoided in all but the most exceptional cases. This applies even to patients who have been anesthetized. It is a question if anesthesia is advisable, because the preanesthetic and postanesthetic periods are usually associated with the rapid development of fanciful ideas which may have a lasting effect on the sensitive mental organism of the adolescent. Delay in resorting to examination and explanation by the patient's mother of the object of the examination, with a minimum of manipulation at the time, are better safeguards than anesthesia in all but exceptional cases. Rectal examination may sometimes be substituted for vaginal.

Hemorrhage at puberty, the so-called virginal menorrhagia and metrorrhagia, may of course depend on a local cause, such as infection, ovarian disease, etc., but such cases are comparatively rare. The majority are cases of "essential" hemorrhage.

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* Read in the Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913

The causes of these essential hemorrhages are numerous and varied. Sufficient mention has already been made of the common constitutional causes, although mitral stenosis probably deserves special mention. Hemophilia, which, contrary to general belief, is not uncommon in a mild form among women, may manifest itself by uterine hemorrhage at puberty; I have seen this prove fatal. So, too, chlorosis and congenital syphilis may cause irregularities at the onset of menstruation.

A factor in menstrual hemorrhage that is worthy of more consideration than it receives at present is the estimation of the calcium index. There is undoubtedly a close connection between the calcium metabolism and menstruation (Blair, Bell). Hyperthyroidism is another cause of increased and irregular bleeding at puberty.

Anomalies of ovarian function in regard to its internal secretion are frequently accused of causing menstrual irregularities in early life. Dalche's explanation is that rapid growth of the body and sudden development and maturation of the ovary unsettles the normal equilibrium and causes a condition of "ovarian ataxia" in which periods of hyperfunction alternate with periods of functional inactivity. This form of "ovarian" hemorrhage is not to be confused with that due to macroscopic disease of the ovaries.

It is apparent that there are two distinct sides to the treatment of uterine hemorrhage at puberty; one the treatment of cause and the other treatment of the acute condition, as at times bleeding is so free that the patient's health is markedly affected.

Treatment of the underlying cause varies in the individual case. No definite rules can be determined on. Girls with a low calcium index should receive from 10 to 20 grains of calcium lactate three times a day. This is the only drug that can be said to have a definite indication, although the list of drugs used is of formidable size, some being administered with the idea of overcoming the underlying cause, others to stop the hemorrhage. Among these may be mentioned ovarian, adrenal, thyroid and pituitary extracts, animal serum, ergotin, hydrastin, stypticin, etc.

The starting place in the treatment of these cases of "essential" uterine hemorrhage is the axiom that such a case should never be curetted. The most essential part of the immediate treatment is rest in bed. Nothing tends to control hemorrhage so effectually. Many men order in addition hot vaginal douches. This is justifiable in married women, but, like all other forms of local treatment, should be avoided in unmarried girls. If it is desired to have the local effect of heat it is best obtained by hot rectal injections, and it is questionable if even these are advisable, as the application of an ice-bag to the abdomen is much more efficacious.

In this connection I should like to state my conviction that routine vaginal douches do more harm than good in most instances. They are one of the many forms of local treatment that increase the number of women suffering from the various sexual psychoneuroses. Many women, married and unmarried, can trace the development of sexual types of mental abnormalities to well-meant but injudicious local treatment. Women doctors are marked offenders in this direction with frequent, unnecessary vaginal examinations, weekly changes of pessaries, and the routine prescription of self-administered vaginal douches. Digital massage of the uterus is a favorite treatment of some osteopaths, with what disastrous results can readily be imagined.

The use of x-rays, which might be expected to have some influence on these cases of hemorrhage, is contraindicated because of their destructive effect on the ovaries. In hyperthyroidism ligation of the vessels or excision of part of the gland might be expected to result beneficially, and that they do not is probably because the symptoms are due more to disordered than excessive secretion. There is a strong reaction against thyroid operations in early life, at least until prolonged and intelligent attempts have been made to control symptoms by hygienic treatment. Gelatin given subcutaneously or by mouth has been recommended. Its use by the former method is dangerous from the standpoint of sepsis, and the latter method is uncertain, although it is said to increase the coagulability of the blood. Electricity is objectionable because it is a form of local treatment.

It seems that we are reduced, therefore, to the effects of rest, quiet, free action of the bowels, ice, calcium, or other drugs as they seem to be indicated; and, above all, the beneficial effects of time, for improvement or cure of these obstinate cases of uterine hemorrhage at puberty.

Again let me sound a warning against curettage and other forms of local treatment. They not only do no good but are distinctly harmful, and are the basis of many of the psychoneuroses that our friends the psychiatrists are revealing to us out of the old order of surgical neurasthenia.

Hemorrhage at the menopause presents problems of a different nature. Irregular and excessive bleeding at this time puts on the attending physician the burden of proving the absence of carcinoma of the cervix or body. For this reason curettage is indicated—in fact, it is imperative—in every case of this description, as it is by this means only that carcinoma of the body can be ruled out. Inspection and section for microscopic examination suffice for the diagnosis of cancer of the cervix.

The treatment of these forms of hemorrhage consists in as complete a panhysterectomy as possible. But these are not the cases that cause trouble and anxiety in diagnosis and treatment. There is a class in which physical examination shows little or no abnormality in the uterus and its appendages; curettage reveals a normal endometrium or a moderate amount of simple endometritis, yet the bleeding continues and becomes more instead of less frequent and severe. These are the cases that have caused the adoption of numerous methods of treatment, all aiming to avoid the necessity for hysterectomy.

The cause usually given for the hemorrhage is sclerosis of the uterine vessels, distinct from and not to be confused with a general arteriosclerosis. The greatest change is in the adventitia and media. The adventitia is greatly increased by the deposit of fibrous tissue, which also involves the surrounding tissue, giving rise to a peri-arteritis. The media is diminished in size because the muscle is replaced by fibrous tissue. The intima is not involved and the lumen of the vessel not encroached on, a differential point from syphilitic atheroma.

This sclerosis may exist independently or be associated with more or less intermuscular fibrosis, which may go to the length of supplanting a certain amount of muscular tissue. These variations in the pathology probably account for the difference in the physical signs in individual cases. In some the uterus is small and apparently normal to examination, in others it is large and soft, and in still others it is large and very firm. The sclerosis of the vessels is common to all three forms and is believed to be the offending agent in the causation of hemorrhage. Simpson believes that the condition of the myometrium plays a greater rôle in the regulation and prevention of hemorrhage from the uterus than the vessels. The sclerosis observed in these cases could readily so interfere with the tonic contraction of the uterine muscle as to prevent occlusion of the vessels by muscular action and thus permit excessive loss of blood.

The various means that have been employed to overcome bleeding of this description have as their object preservation of the uterus and the maintenance of the normal menstrual flow. This is of course an advantage in younger women, in whom this condition is said to occur with greater frequency than at first supposed.

Curettage is always the first step in the treatment of these cases, to enable one to exclude carcinoma. On this point every operator is agreed. Subsequent treatment marks the particular predisposition of the individual surgeon.

To mention non-operative methods first, the x-ray and electricity are the most prominent contenders for popular favor. Several observers have had varying degrees of success in controlling hemorrhage by the use of x-rays. They act by causing atrophy of the ovaries and subsequent atrophy of the whole genital tract, including the uterus. For cases in which operation is refused or contra-indicated there is no doubt that the x-rays offer a fairly satisfactory method of treatment, but in my experience one not always to be relied on. There is a fairly large percentage of failures and thus valuable time may be lost. On account of their effect on the ovaries, the x-rays cannot be used on young women.

Electrical treatment has various advocates (particularly Hirst). I have had no experience with it except in meeting cases that have relapsed after a more or less prolonged period of freedom from symptoms after a course of electrical treatment. I have never been able to persuade myself that there is any field for such treatment.

Atmocausis, the application of live steam to the uterine cavity, has occasional advocates in various parts of the world, who are all positive in their statements that good results can be obtained by its use, particularly in cases that occur during the child-bearing period. when radical treatment is to be avoided if possible. In these cases the endometrium is cooked, but not sufficiently to cause subsequent sloughing. At times destructive atmocausis is undertaken with the view of causing complete occlusion of the uterine cavity by sloughing and subsequent adhesion.

The action of the steam is difficult to regulate to just the required degree and the prevention of infection is almost impossible. I myself have no faith in the ability to cure by atmocausis any but the very mildest cases of hemorrhage and feel sure that any field of usefulness it has is extremely limited. I never use it.

Of other forms of treatment, hot air, vibratory massage, active and passive hyperemia, zinc injections and animal serums I have had no experience. It would be impossible for any one man to try all the methods that have been advocated, and each operator must work out for himself his own views.

Occasionally one of these patients bleeds so freely that immediate local treatment is necessary. Plugging the uterine cavity and vagina with gauze will always stop the bleeding, but should be done only when asepsis is sure. Under other circumstances a vaginal plug, firmly pushed home into the vaginal fornices, is safer and practically as certain of stopping hemorrhage.

Most of the obstinate cases of uterine hemorrhage that fall into my hands have been the rounds of various "specialists," who have put them through all the different recognized and unrecognized forms of local, general and absent treatment. These patients come to me with a vigorously expressed desire for cure, having been thoroughly disgusted by the time and money they have wasted without getting relief.

Naturally these represent the failures of other treatments, and it may be that my experience has made me too skeptical of the value of forms of treatment other than operative, as I never encounter the successes of the conservative methods.

I believe that in a well-marked case of uterine hemorrhage due to sclerosis of the vessels, complete removal of the uterus is the only sane treatment.

I wish particularly to direct attention to the advantages of a preliminary hysterotomy in certain cases. I advocated a year ago in this Section hysterotomy as the operation of choice in placenta praevia; in occasional neglected cases of the toxemia of pregnancy and in certain cases of menorrhagia and metrorrhagia in which carcinoma and gross disease of the uterus appeared not to be a factor. By thus opening the uterus I have on several occasions disclosed a nonmalignant polypoid condition of the endometrium which could be much more thoroughly treated under direct inspection than by blindly curetting from below through the os. Occasionally, also, one or more fibroid nodules may be discovered beneath the endometrium and removed with ease. The usual method of curetting could hardly be successful in the removal of these small submucous myomas. I have had no mortality from hysterotomy and believe it to be an operation deserving of wider application. Practically the only danger of any moment is that of infection of the abdominal cavity. If the uterus and the field of operation be well walled off with gauze pads this danger may be minimized, even in the presence of an infected uterine cavity. It must be remembered that the operation of hysterotomy, partial or complete, is not free from the dangers of infection. Still, I would not venture hysterotomy in the case of a boggy uterus evidently the seat of metritis. This condition is rare, however, and it is my belief that the risk of infection following hysterotomy is greatly magnified by the objectors to the operation. Having had great satisfaction from the operation in selected cases, I do not hesitate to employ it and to recommend it to experienced surgeons.

The question of the desirability of complete hysterectomy is settled by the patient's age, degree of uterine disease and the chances of the subsequent development of carcinoma. In women of 40 or over I never hesitate to do the complete operation, as the uterus is of no actual use to most women of this age. I remove the ovaries at the same time, as they may be the cause of symptoms, and, while they cannot cause hemorrhage after the removal of the uterus, they are still a potential menace to subsequent good health by their tendency to tumor formation and the possibility of the perversion of their internal secretion. Occasionally in operating for a supposed uterine cause of hemorrhage one finds an ovarian hematoma or hemorrhage into a lutein cyst, which is probably the fundamental cause of the hemorrhage. I do supravaginal hysterectomy and appendectomy in these cases.

SUMMARY OF CASES STUDIED

The total number of cases studied was 227.

Sixty-nine cases of fibromyoma uteri and 2 cases of carcinoma uteri which never presented symptoms of menorrhagia or metrorrhagia.

Forty-five cases, pathologic diagnosis of endometritis. Operations performed: complete hysterectomy in 5 cases (past menopause); anterior hysterotomy and curettage in 1 case; vaginal hysterectomy in 2 cases; dilatation and curettage in 37 cases.

Twenty-one cases, pathologic diagnosis of fibromyoma with endometritis. Operations performed: supravaginal hysterectomy in 17 cases; complete hysterectomy in 3 cases; vaginal hysterectomy in 1 case.

Twenty-four cases, pathologic diagnosis of carcinoma. Operations performed: complete hysterectomy in 12 cases; supravaginal hysterectomy in 4 cases; dilatation, curettage and cauterization in 1 case; dilatation and curettage in 1 case; cauterization in 1 case; vaginal hysterectomy in 1 case; 4 cases inoperable.

Forty-four cases, pathologic diagnosis fibromyoma. Operations performed: supravaginal hysterectomy in 31 cases; complete hysterectomy in 7 cases; anterior hysterotomy in 2 cases; myomectomy in 3 cases; vaginal hysterectomy in 1 case.

Two cases, pathologic diagnosis sarcomatous degeneration of fibroid uteri, supravaginal hysterectomy being performed in both cases.

Mortality.—Four deaths, all occurring in cases of carcinoma. In one carcinoma also involved the sigmoid and the patient developed fecal fistula; one patient died of uremia and two of toxemia.

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ABSTRACT OF DISCUSSION

DR. LEWIS S. MCMURTRY, Louisville: A point on which I would differ from Dr. Deaver is regarding anesthesia of virgins for examination of the uterus. It is practically impossible to make a satisfactory examination without anesthetizing the patient. She is unable to control the voluntary muscles and the resistance is such that examination is impossible. I would emphasize Dr. Deaver's statement that hysterotomy should be a means for diagnosis only in the hands of experienced surgeons. In the hands of men accustomed to opening the abdomen every day it is a safe procedure. and in many cases it is justifiable. As a routine procedure it would be a very dangerous practice. All of us who have operated for fibroma have opened the uterus to find that all the hemorrhage was caused by a small polyp in the fundus and that hysterotomy would have reached it. Hysterotomy as an exploratory operation for cancer of the uterus is seldom necessary.

Dr. Deaver rendered special service in calling attention to two salient points: (1) that this symptom should be dealt with as a symptom; (2) that there should be a thorough investigation made of every woman who has a persistent uterine hemorrhage to find the pathology and deal with it in a surgical way. I would especially commend the suggestion which Dr. Deaver makes as to young women at puberty, who have persistent hemorrhage without demonstrable lesion of the uterus or its appendages. Rest and general systemic treatment should be observed rather than resort to indiscriminate dilatation and curettage and other active surgical treatment. In conclusion, it is neccessary to reiterate the oft-repeated warning as to the vicious practice of resorting to the curet indiscriminately for uterine hemorrhage. Curettage is more abused to-day than any other surgical operation and does more harm.

CLINICAL NOTES ON PATIENTS FROM THE MIDDLE NORTHWEST INFECTED WITH ENTAMEBAS *

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In 1911, Sistrunk[1] published our earlier experience at the Mayo Clinic with regard to the finding of intestinal parasites in individuals residing in the middle Northwest. Since then the examination of the stools in certain cases has led so frequently to the identification of entamebas that we have come to consider this infection as a relatively common one. In the diagnosis of the different types of amebas present, Craig's[2] description of the morphologic characteristics has been followed in our laboratories by Sistrunk and Sanford. Moreover, the recent work of Darling[3] and Craig[4] on the identity of *Entamoeba tetragena* with *Entamoeba histolytica* inclines us to prefer to group cases in which a morphologic diagnosis of either one of these parasites was made as *Entamoeba histolytica*. In this review, however, the former distinctions between *tetragena* and *histolytica* are maintained because of any interest that may remain in connection with the morphologic type of those amebas found in the Northern states.

During the last two and one-half years the stools of 1,700 patients have been examined for parasites. Entamebas have been found in 227 of these, or 13 per cent. Of this number, 148 were diagnosticated as *Entamoeba coli* and 79 as *Entamoeba tetragena* or *Entamoeba histolytica*. These totals include patients from all parts of the country who have been under our observation. This consideration, however, will be confined entirely to those with residence in Minnesota, Iowa, Wisconsin, North and South Dakota, Montana and Nebraska, whose infection, as nearly as can be judged, was not obtained in the South. Most of these patients had never been in the South. A few had traveled in the South but their visit seemed to have no relation to the onset of their symptoms. The first part of this paper is concerned with a consideration of those cases in which *Entamoeba tetragena* and *Entamoeba histolytica* were present; the latter part with a consideration of the cases showing *Entamoeba coli*.

CASES IN WHICH ENTAMOEBA TETRAGENA OR ENTAMOEBA HISTOLYTICA WAS FOUND

Of the seventy-nine patients showing *Entamoeba tetragena* and *Entamoeba histolytica*, forty-one, or a little less than one-half, evidently received their infection while residing in the before mentioned states and therefore constitute the most important group for our immediate consideration. Of this number, there were from Minnesota 14, Iowa 12, North Dakota 5, South Dakota 5, Nebraska 2, Wisconsin 2, and Montana 2.

Of the forty-one patients, thirty-six showed *Entamoeba tetragena* and only six *Entamoeba histolytica* (one of these, a patient with very severe symptoms, showed both *tetragena* and *histolytica*). It is therefore a prominent fact that the parasite of predominance conforms morphologically to the description of *Entamoeba tetragena*. In those cases showing *Entamoeba histolytica* the parasites were more numerous, though it is quite certain that these patients did not receive their infection in the South.

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* Read in the Section on *Practice of Medicine* of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

[1] Sistrunk, W. E.: Intestinal Parasites Found in Individuals Residing in the Northwest, THE JOURNAL A. M. A., Nov. 4, 1911, pp. 1507-9.

[2] Craig: The Parasitic Amebas of Man, Ed. 1, 1911, Phila.

[3] Darling, S. T.: Budding and Other Changes Described by Schaudinn for Entamoeba Histolytica, THE JOURNAL A. M. A., April 19, 1913, p. 1220.

[4] Craig, Charles F.: The Identity of Entamoeba Histolytica and Entamoeba Tetragena, THE JOURNAL A. M. A., May 3, 1913, pp. 1353-4.

In a consideration of the clinical symptoms of these cases the original chief complaint of the patient becomes an interesting basis for classification.

Group 1. Patients complaining chiefly of diarrhea.—Twenty-four of the forty-one patients complained chiefly of diarrhea. Thirty-five patients of the forty-one, however, gave a history of diarrhea, although in some of these it was not their chief complaint. Thirteen had had, at one time or another, severe attacks of diarrhea with more or less blood in the stools. As nearly as can be judged, however, these attacks were not so violent as those in cases reported from the South. On the other hand, most of our patients gave a history of more or less constant diarrhea of a mild type, also quite in contrast to the Southern cases. More than one-half the patients gave a history of the passage of macroscopic blood at one time or another in the course of their disease.

Group 2. Patients presenting themselves chiefly on account of abdominal pain.—A second group of cases consists of those patients who complained chiefly of abdominal pain, nine in number. It has been our custom to send patients complaining of indefinite abdominal symptoms for a stool examination and the finding of parasites in this group of cases is due to that routine. The findings, of course, may be accidental, although at least two patients of this group are well of their original complaint.

Three-fourths of the patients (thirty-two) gave abdominal pain as a minor complaint. Pain was not confined to the lower abdomen; ten of the number suffered from upper abdominal pain and six complained of pain in the right lower quadrant, suggesting the possibility of involvement of the cecum. Rectal pain was a prominent symptom in four patients.

Group 3. Those complaining of indefinite gastric symptoms.—Patients complaining of indefinite gastric symptoms have often been referred for stool examination. Three patients in the series, who consulted a physician chiefly on account of gas and sour eructations, nausea and epigastric distress, have shown pathogenic entamebas. Complaint of this character, however, is not uncommon in the other cases. Fifteen of the forty-one patients gave a history of gastric symptoms, although they complained chiefly of abdominal pain or diarrhea. Nausea seems to be quite commonly associated with the more severe attacks, eleven of the series volunteering this information.

Group 4. Patients with constipation.—It is rather not to be expected that *Entamoeba tetragena* should be found in patients complaining chiefly of constipation and without diarrhea. In two instances of this character, however, amebas were easily demonstrated. Intermittent constipation, even in connection with those cases showing severe diarrhea, is not an uncommon finding.

Group 5. Miscellaneous cases.—In the remaining three cases dyspnea and weakness were given as the chief complaints and were the result of severe anemias. Two of these anemias were definitely of the pernicious type, while one was of doubtful nature and may have been entirely secondary. The finding of entamebas in cases of pernicious anemia can only be regarded as accidental.

Only one case of abscess of the liver has been observed among patients from the middle Northwest. In this instance *Entamoebae histolyticae* were demonstrated in the stools; the abscess, which was drained, was of typically amebic character. The patient resided in Duluth, had never been in the South and gave a six weeks' history of diarrhea with bloody stools. It is not certain that this patient received his infection in Minnesota. He had emigrated from Russia six months previously but his history had been of only six weeks' duration.

The duration of the history relative to the bowel symptoms for the entire group of forty-one patients varied from six weeks to twenty years. In six of the patients it was longer than ten years, in ten over five years, while in seventeen it was less than a year; the average was four years.

The eosinophil count was low. Three of the series showed no eosinophils on differential count; the average in twenty-one counts was only 2.5 per cent. In this connection it may be of interest to note that thirteen patients have been sent to the laboratory on account of a very high percentage of eosinophilia in order that a search for parasites might be made and in all of these instances the results were negative for entamebas.

Proctoscopic and sigmoidoscopic examinations were obtained in twenty-three of the forty-one patients. In sixteen they were negative, in three a diffuse colitis was demonstrated, in two a granular colitis and in two ulceration. Those cases showing ulceration and diffuse or granular colitis were all infected with *Entamoeba tetragena*. It should be remembered that a negative proctoscopic examination may not necessarily mean a negative colon, as the disease may be localized at one of the flexures or in the cecum. It is quite likely, however, that the large number of negative examinations is at least another indication of the mild character of these cases in comparison with the infections in the South. From the patient's point of view, however, they are severe enough to be a great inconvenience and detrimental to the general health.

The parasites were usually demonstrated at the first examination. In thirty-one instances amebas were found at the first examination, in nine two examinations were necessary and in one case three examinations. It is also evident, therefore, that the search for parasites should not to be abandoned too early. In the case in which three examinations were necessary for a demonstration of the parasites the patient had complained of intermittent attacks of diarrhea with bloody stools for four years.

CASES IN WHICH ENTAMOEBA COLI WAS DEMONSTRATED

As formerly stated, *Entamoeba coli* was reported in 148 patients. Of these, 106 were in patients residing in the middle Northwest. Fifty-nine, or over one-half of these patients consulted a physician chiefly because of diarrhea, while in sixty-nine or two-thirds of them diarrhea was given as one of the principal complaints. One showed granular colitis, eight diffuse colitis and four ulcerative colitis on proctoscopic examination. Of those presenting themselves chiefly on account of diarrhea, one-third gave a history of more than five years' duration, nine more than ten years and four more than twenty years. In many of them the diarrhea was severe in character. Thirty-eight or over one-third showed red blood-cells on microscopic stool examination, while sixteen gave a history of macroscopic blood. The parasites were usually found at the first examination. In only seven of the 106 patients was a second stool examination necessary for the demonstration of the amebas.

We have no data on which to base a discussion of the possible pathogenicity of *Entamoeba coli* either positively or negatively, and present these facts only as statements of our findings.

The presence of *Entamoeba coli* in the more severe cases need indicate no etiologic relationship on the part of these organisms. And again it is quite likely that a further search for parasites would have demonstrated the presence of *histolytica* also in some instances; several of our more recent cases showed *Entamoeba coli* at the first examination and *Entamoeba histolytica,* as well as coli, subsequently.

TREATMENT

It has been very difficult to obtain an approximately accurate idea of the results of treatment in this series of cases. It has generally been necessary for the patient to return to his home where the treatment was carried out under the care of the family physician. Ipecac alone was used in 75 per cent. of the cases in which treatment seemed advisable. Ipecac was administered in conjunction with coal-oil enemas to eight patients. This does not take into account the treatment of those patients residing elsewhere than in the middle Northwest. Enemas of kerosene (Hanes[5]) alone were used under our observation in four instances in which *Entamoeba tetragena* or *Entamoeba histolytica* was present (one of these showed ulcerative colitis), and in all of them the results were excellent. It is our impression that coal-oil enemas should be given a trial in cases of entamebic infection in order that we may learn something more definite with regard to their efficacy. The administration of emetin hydrochlorid is considered by many observers of large experience to be almost specific in its action, and is especially indicated in severe types of infection (Rogers[6]).

It may be emphasized that amebas are generally demonstrated easily at the first examination if the patient be properly prepared and the stool properly obtained. Epsom salts may be given early in the morning and an hour or two later the patient reports at the laboratory where one or more stools may be examined while they are yet warm. It is a noticeable fact that the search may be difficult either in a stool that is too well formed or in one which is too watery.

It may be well to urge a more wide-spread interest in the examination of stools for parasites in the Northern states. Undoubtedly entamebic infection is a quite generally unrecognized cause of diarrhea, and probably of certain indefinite abdominal complaints. At the same time it should be remembered that the finding of parasites can be regarded only as a part of the evidence in the diagnosis of any condition of the bowel; there may be a tendency to ascribe a patient's complaints too quickly to this finding.

ABSTRACT OF DISCUSSION

Dr. Van G. Yeager, Hayward, Wis.: I practiced formerly in Lake Charles, La. In that particular section of the country we have a great deal of amebic dysentery. I recall one case in which the patient passed, on an average, from fifteen to twenty stools in twenty-four hours. When he came to my office his stool consisted entirely of mucus and blood, and on examination I could find from five to ten amebas in the one-sixth field. If the patient is given a good dose of magnesium sulphate in the morning, without any breakfast, it will be possible to obtain a stool thin enough, in most instances, to demonstrate the ameba without difficulty.

In amebic infections in the early stage, there is probably always a marked eosinophilia, but when the infection has lasted sufficiently long to give marked symptoms the differential count is often of little value, for whatever the increase in eosinophils means, and it probably indicates a fight against poisons from intestinal infections with parasites, it surely approaches the normal as the system becomes accustomed to the poisons which produce it.

I have treated probably ten or fifteen severe cases of this kind. Ipecac gave satisfactory results in all. Dr. Simon in the Charity Hospital in New Orleans uses five-grain salol-coated pills, giving from 60 to 100 grains each night for a week. The salol coating is not dissolved in the stomach, but in the intestine where the effect of the ipecac is wanted, and thus the nauseating effect which would result from such enormous doses of ipecac in the stomach is avoided. To avoid the taking of much medicine some pharmaceutical houses have placed in the hands of physicians who are in positions to make careful observations a preparation of emetin which is given hypodermically with success. Most patients will be nauseated, aside from the ipecac, just from taking a great deal of medicine. By giving paraldehyd, which is one of our safest hypnotics, immediately after the ipecac, the patient will sleep until the ipecac has had time to be effective. I recall one patient who vomited frequently during the first few hours after taking ipecac. I advised him to take paraldehyd, which he did, sleeping soundly afterward for about six hours; he vomited immediately on awakening, however. This is a common experience.

Dr. Charles L. Minor, Asheville, N. C.: I wish to ask if the 100 grains are given in one dose, or in a number of doses during the twenty-four hours?

Dr. Van G. Yeager, Hayward, Wis.: The 100 grains are given in one dose at night. This treatment is carried out for a week, the patient being given from 60 to 100 grains each night and being kept on a light diet and in bed. One advantage of a light diet is that the bowel is empty, and the ipecac comes in contact with the ameba.

Dr. W. C. Dixon, Nashville, Tenn.: In the South we see many cases of amebic dysentery. I have used the ipecac treatment, giving large doses, but it is exceedingly unpleasant. I have not been so successful in avoiding the nausea as the doctor seems to have been in his cases. I have recently been able to secure emetin hydrochlorid and have obtained good results from its use. Previously, I used the emetin resinoid in solution. This is the most satisfactory treatment for dysentery with which I am familiar. The dosage of the hydrochlorid is one grain in twenty-four hours, given under the skin of the arm; the effect is almost magical in acute cases, or in chronic cases with much ulceration and many amebas in the stools. In the course of three or four days most of these cases clear up. It has been far more satisfactory than irrigation with quinin, coal-oil or any other agents that have been used. It is easy to give. The patients do not necessarily go to bed, although it is probably better if they are kept in bed and on a liquid diet. They are given one-fourth of a grain of the emetin one day, half a grain the next day, a grain the next day, and a grain each succeeding day. At the end of three or four days the stools are usually free from amebas and the patient makes an uninterrupted recovery.

The credit for this treatment is due to Dr. Rogers of Calcutta, India. He has had an extensive and satisfactory experience with it. He seems to have cured a number of patients with abscess of the liver by aspiration and injection of emetin into the cavity, together with the hypodermic administration of the emetin. I have had only one case of abscess of the liver in which I used emetin. The patient was in an extreme condition, the abscess was aspirated and one grain of emetin in solution was injected into the cavity. The patient showed some improvement for a few days, and then died rather suddenly. At necropsy it was found that he had two abscess cavities in the liver, the upper one having ruptured into the pleura, the lower one having been aspirated.

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[5] Hanes, Granville S.: Amebic Dysentery, THE JOURNAL A. M. A., June 19, 1909, pp. 1990-2.

[6] Rogers: Brit. Med. Jour., June 22, 1913, pp. 1424-5; ibid, Aug. 24, 1912, pp. 405-9.

DR. G. D. HEAD, Minneapolis: We have a form of chronic diarrhea in the North, occurring in persons who have never been in the South. It is due to some intestinal parasites of which Dr. Giffin has spoken. There is, however, a form of diarrhea of which I have seen many cases, in which one finds in the stools the *Trichomonas intestinalis.* This form of chronic diarrhea lasts for years and simulates quite closely the diarrhea due to *Ameba coli.* Tremendous numbers of these flagellates are often found in the stools. They are recognized immediately with a one-sixth objective. If the flagellates can be gotten out of the stools, the diarrhea, as a rule, ceases. We find, however, great difficulty in killing them out. I am sure that this is a chronic form of diarrhea endemic in the North. I do not know where the flagellates come from. Even Dr. Giffin gives no explanation as to how the entamebas get into the stools in the North. When a physician meets a case of chronic diarrhea in the North, he should examine the stools as systematically and carefully as the physician in the South.

DR. W. V. BREM, Los Angeles, Cal.: Dr. Bass has been using emetin hypodermically in the treatment of experimental amebic infections and prophylactically in quite a number of patients. He believes that of all the specifics in medicine emetin is probably the best against amebic infection.

Some time ago in reporting the result of the use of ipecac in amebic dysentery in Panama, I discussed at length the bismuth treatment as used by other men in Panama, and I expressed considerable doubt about its efficiency. I have recently examined the stools of a patient who was under treatment with ipecac according to the method that I felt to be the best. The treatment had no effect on the infection so far as eradication of the amebas was concerned. The patient was then put on the bismuth tratment, which immediately cleared up the infection. Darling, in Panama, has recently reported that he examined the stools of twenty-eight patients who had had amebic dysentery and been treated with bismuth. He found amebas in only one instance. The bismuth treatment of Deeks and Shaw may, therefore, be quite effectual in the treatment of amebic dysentery.

DR. W. W. TOMPKINS, Charleston, W. Va.: Will Dr. Giffin give the details of the coal-oil injection? It seemed to be satisfactory in all the cases.

DR. H. Z. GIFFIN, Rochester, Minn.: I shall answer only the question concerning the coal-oil treatment. Kerosene enemas have been used in the treatment of entamebic infections for four or five years. I have employed them alone in only a few cases, but with satisfactory results. After a few injections it was impossible to find the parasites. This is the reason I suggest that possibly this treatment should be given a further trial. After the large bowel is cleansed, about one quart of coal-oil is injected. The patient retains it for fifteen or twenty minutes, sometimes longer. The treatment is repeated about twice a week. There is no abdominal complaint whatever. The only irritation is possibly at the rectum, and this is easily overcome by using a small amount of petrolatum.

DR. W. W. TOMPKINS: What is meant by coal-oil? Does it mean simply kerosene?

DR. H. Z. GIFFIN: It means kerosene.

SARCOMA OF THE CHORIOID

A CASE WITH METASTASIS TO THE LIVER EIGHT YEARS AFTER ENUCLEATION OF THE EYE

AARON BRAV, M.D.
Ophthalmologist to the Lebanon Hospital
PHILADELPHIA

Sarcoma of the chorioid endangers not only the visual organ, but also life. When the eye is removed the prognosis as to life is absolutely grave. Even after the eye is removed life is still in danger, for it is impossible to foretell whether or not sarcomatous cells have been carried, prior to the enucleation, into the deeper tissues of the body. When the sarcoma is removed late in the course of the disease there is often a recurrence of the condition in the enucleated orbit, which eventually is the cause of death. If the eye is enucleated early, however, there is usually no recurrence locally, but the patient is still not free from the danger of metastasis. The case here reported shows a metastatic growth making its appearance eight years after the eye has been enucleated.

Miss A. L., aged 18, consulted me Feb. 5, 1905, on account of failing eyesight. Her left eye had been gradually failing for about two months. She felt otherwise well. She had a good family history. Examination showed both eyes quiet and free from any inflammation; right eye, perfectly normal; left eye, cornea normal; pupil 6 mm.; no reaction to light; vision equal to light perception.

Ophthalmoscopic examination showed a dark media and no fundus reflex. With a plus 7 lens several blood-vessels were seen over a grayish retina, which was detached. The eyeball was slightly prominent as compared to the right eyeball. The diagnosis was retinal detachment with a suspicion of a chorioidal tumor as the etiologic factor.

February 8: The eyeball protruded and tension was plus 2. Eye was somewhat painful on pressure and patient had headaches. I informed the patient of the gravity of the situation and advised an enucleation. Dr. Schwenk in consultation agreed with me. The patient, however, would not submit to an enucleation.

May 30: The patient returned with badly inflamed eye, severe pain and tension plus 3. The severe headache was evidently caused by the high intra-ocular pressure. Again I insisted on enucleation. She consented only after repeated warning on account of the danger to life.

June 8, 1906: The eyeball was enucleated and examined. A pigmented tumor the size of a small hazelnut was found at the posterior pole. Microscopic examination showed the tumor to be a melanotic sarcoma.

July 6: An artificial eye was inserted. No local recurrence followed and patient was well. She married in 1909 and gave birth to a healthy child.

Jan. 12, 1912: The patient consulted me on account of a conjunctivitis, which readily yielded to treatment. Otherwise the patient was in good health.

Jan. 3, 1913: The patient gave birth to another child. After delivery the family physician, Dr. Jacob, noticed an enlargement of the liver, which increased rapidly. Dr. Tyson was called in consultation and diagnosed a malignant growth of the liver. At the special request of the patient and family, and with consent of the attending physician, I saw the patient, January 10. I found her in bed, markedly emaciated and yellowish pale in color. The liver was very large, coming down below the umbilicus, filling in practically the entire abdominal cavity. The growth was lobulated. Four distinct lobules could be felt. The patient was very weak. She died May 6. No post-mortem was obtainable. The diagnosis, however, was clear.

The case is of considerable interest and shows that in sarcoma of the chorioid metastatic growths with a fatal termination may occur at any remote period after the eye has been enucleated, even though the tumor did not recur locally. It further emphasizes the absolute necessity of early diagnosis and prompt removal of the eye in order to save life.

917 Spruce Street.

Necessity of Vital Statistics for Control of Contagious Diseases.—A community which has no means of knowing with what contagious diseases it is afflicted, nor how many cases there are, nor where they are, is helpless to protect itself, and unnecessary sickness and death will result.—Assistant Surgeon-General Trask.

Special Article

ELEVENTH ANNUAL SUMMARY OF FOURTH OF JULY INJURIES

This week, for the eleventh consecutive year, THE JOURNAL presents statistics of deaths and injuries resulting from the celebration of the Fourth of July, with particular reference to tetanus or lockjaw resulting from these injuries. With the rapid decline in the number of casualties in the last few years, instead of relaxing its vigilance THE JOURNAL has made extra effort to secure complete and accurate data. As reported last year, a large majority of the blanks were returned from hospitals with the statement that no cases were treated. From others only a few names were reported, whereas in previous years several pages were required to contain the lists. Our thanks are extended to health officers, hospital superintendents, physicians and others for the careful reports which have made these statistics practically complete and the figures fairly reliable. The data are presented in the same manner as heretofore so that the comparison with the figures of previous years may be made.

TABLE 1.—CASES OF TETANUS

Name.	Sex.	Age.	Cause of Wound.	Site of Wound.	Duration in Days*	Day Antitoxin was used.	Termination
INDIANA							
Harris	M.	15	Bl. ctg.	Hand	(4) 6	..	D.
KANSAS							
Maccenalougue	M.	14	Bl. ctg.		......	..	D.
NEW YORK							
Ross	M.	12	Bl. ctg.	Hand	7	..	D.
Evans	M.	11	Bl. ctg.	Hand	(11) 31	11	R.

* Figures in parentheses show incubation period.

TABLE 2.—TETANUS CASES BY STATES
Comparison With Previous Years

	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913
Alabama	.	..	1		.	..	..	..	..	..	..
Arizona	..	..	.	.	1	..	..	..	..	..	..
California	2	4	4	3	1	.	2	1	2	1	..
Colorado	4	..	1	..	..	..	..	..	..	..	..
	3	.	3	..	4	1	..	..	..	..	..
	..	.	1	1	1	..	2	..	..	..	..
	1	..	..	..	..	..	..	..	..	..	..
	..	..	..	..	..	..	1	..	..	..	..
Georgia	..	..	..	..	1	..	..	..	..	.	..
Idaho	1	..	..	..	..	..	1	..	..	..	..
Illinois	49	15	20	16	12	12	20	10	3	..	..
Indiana	11	6	3	8	2	..	9	6	..	1	1
Iowa	14	2	3	4	4	1	1	1	1	..	..
Kansas	11	1	..	..	2	1	6	..	..	..	1
Kentucky	4	2	..	1	..	1	1	..	..	..	..
Louisiana	.	..	..	..	.	..	..	..	..	..	..
Maine	2	4	1	1	..	1	1	1	..	..	..
	1	..	1	1	..	..	2	1	..	..	..
	16	5	7	3	2	5	8	..	1	1	..
	29	7	9	4	4	2	11	11	2	1	..
	15	2	2	2	2	..	..	..	..	..	..
	29	1	3	3	1	5	8	2	..	..	..
	2	1	1	..	1	..	3	2	..	..	..
	4	3	3	1	..	1	3	1	..	..	..
	2	..	..	1	..	..	1	..	..	..	..
New Jersey	8	9	3	10	8	10	19	9	2	..	..
New York	26	9	6	8	4	9	11	7	1	..	2
North Dakota	..	..	..	..	..	..	..	..	..	..	..
Ohio	67	9	5	7	6	7	12	3	3	..	..
Oklahoma	1	..	1	1	..	1	..	1	..	1	..
Oregon	2	..	..	1	1	1	..	..	..	..	..
Pennsylvania	82	17	12	5	7	7	10	11	1	..	..
Rhode Island	3	..	..	1	..	..	..	..	..	..	..
South Carolina	..	..	..	..	..	..	..	..	..	..	..
South Dakota	..	..	..	..	..	1	1	..	..	..	..
Tennessee	..	..	..	..	..	..	..	..	..	..	..
Texas	..	..	..	..	2	..	..	..	..	..	..
Utah	..	1	1	..	..	..	..	1	..	..	..
Vermont	3	2	..	2	2	..	..	..	..	..	..
Washington	2	1	..	..	2	4	4	1	..	..	..
West Virginia	3	..	..	2	..	1	4	..	..	2	..
Wisconsin	10	4	13	2	3	5	9	3	2	..	..
Wyoming	..	..	..	1	..	..	..	..	..	..	..
Total	417	105	104	89	73	76	150	72	18	7	4
States having cases	30	21	23	25	23	20	25	18	10	6	3

FEWER CASES OF LOCKJAW

Only four cases of tetanus were reported this year as compared with seven last year, eighteen in 1911, seventy-two in 1910 and 150 in 1909. The returns this year are most encouraging and give hope that deaths from this senseless cause will soon cease.

TABLE 3.—RATIO OF TETANUS CASES TO BLANK CARTRIDGE INJURIES

Year.	Tetanus Cases.	Blank Cartridge Injuries.	Ratio.
1913	4	97	1:24.25
1912	7	75	1:10.71
1911	18	185	1:10.28
1910	72	450	1: 6.25
1909	150	1,225	1: 8.17
1908	76	942	1:12.39
1907	73	606	1: 8.16
1906	89	979	1:11.00
1905	104	809	1: 7.78
1904	105	905	1: 8.62
1903	417	1,672	1: 4.27
Totals	1,115	7,945	1: 7.12

The ages of the four lockjaw patients this year were 15, 14, 12 and 11 years, respectively, and all were boys. In three cases the injury was on the hand; in the other the site was not given. The length of time between injury and death was six days in one and seven days in another. In the third case the dates were not given by which the time could be computed, and in the fourth patient (who recovered) the time between the injury and complete recovery was thirty-one days. The figures in parentheses (Table 1) give the number of days between the time of injury and the appearance of active symptoms of tetanus, this being in four and eleven days, respectively. In the patient who recovered, antitoxin was first used on the eleventh day, when active symptoms appeared. The long incubation period would seem to indicate a germ of feeble virulence, which may partly account for the recovery. The list of tetanus cases is given in Table 1.

TABLE 4.—CAUSES OF TETANUS CASES

Year.	Blank Cartridge.	Giant Cracker.	Cannon.	Fire-arms.	Powder, etc.	Total.
1903	363	17	5	3	29	417
1904	74	18	5	1	7	105
1905	65	17	4	5	13	104
1906	54	17	1	7	10	89
1907	52	8	6	4	3	73
1908	58	5	4	3	6	76
1909	130	9	1	4	6	150
1910	64	2	..	5	1	72
1911	15	1	1	..	1	18
1912	7	..	..	..	..	7
1913	4	..	..	..	..	4

DISTRIBUTION OF TETANUS

The tetanus cases by states are shown in Table 2. Cases occurred in only three states this year as against six states last year, ten states in 1911, eighteen states in 1910 and twenty-five states in 1909. Two of the cases occurred in New York and one case each occurred in Indiana and Kansas.

THE DEADLY BLANK CARTRIDGE

Blank-cartridge wounds, which have always been responsible for a large majority of tetanus cases, this year caused all four cases. With a full knowledge of this fact and of the awfulness of the deaths from lockjaw, there should be no relaxation in the restrictions against the use of blank-cartridge pistols.

As may be noted on comparison of the statistics of this year with those of previous years (Table 3), there is a significant ratio each year between the number of tetanus cases and the number of blank-cartridge wounds. A larger number of blank-cartridge wounds almost invariably brings also a larger number of cases of lockjaw. The smaller number of tetanus cases in recent years in proportion to the blank-cartridge injuries is doubtless due to the greater care in treating wounds from this cause.

TABLE 5.—CASES OF TETANUS FROM OTHER CAUSES

	1908	1909	1910	1911	1912	1913
Alabama	...	...	1	1	...	...
Arizona	...	...	...	...	...	1
Arkansas	2	...	...	...	...	...
California	4	4	1	2	7	10
Colorado	3	...	...	1	...	...
Connecticut	2	2	...	...	...	...
Delaware	2	1	...	...	...	...
Dist. of Col.	...	...	...	...	...	...
Florida	2	...	...	...	...	...
Georgia	...	1	...	...	...	...
Idaho	...	...	...	...	...	...
Illinois	17	18	7	6	10	7
Indiana	6	4	1	2	1	3
Iowa	2	7	3	1	...	2
Kansas	4	...	1	...	...	...
Kentucky	5	5	...	1	2	...
Louisiana	1	...	...	1	3	3
Maine	...	...	...	...	...	...
Maryland	3	...	2	1	1	...
Massachusetts	3	5	...	...	...	...
Michigan	4	5	1	...	...	...
Minnesota	4	2	...	...	...	...
Mississippi	...	...	...	...	...	...
Missouri	12	5	1	2	3	...
Montana	...	...	...	...	...	...
Nebraska	...	3	1	1	1	...
Nevada	...	...	...	...	...	...
New Hampshire	...	...	...	...	...	...
New Jersey	7	8	8	1	...	...
New Mexico	...	1	...	...	...	...
New York	17	12	4	2	4	...
North Carolina	1	...	...	...	...	1
North Dakota	1	...	...	...	...	...
Ohio	23	13	2	...	2	1
Oklahoma	...	...	...	...	...	...
Oregon	...	1	3	...	2	...
Pennsylvania	21	21	8	6	4	1
Rhode Island	...	1	...	...	...	...
South Carolina	...	...	...	...	...	...
South Dakota	2	2	...	...	...	...
Tennessee	3	...	...	...	1	1
Texas	4	1	1	...	...	...
Utah	...	...	...	...	...	...
Vermont	...	...	1	...	...	...
Virginia	4	1	...	1	2	1
Washington	2	...	...	...	1	...
West Virginia	...	1	...	...	...	...
Wisconsin	5	4	1	...	...	1
Wyoming	...	...	...	...	...	...
Total	166	128	47	29	44	32
States reporting cases	29	25	18	15	15	12

Of the four cases of tetanus reported this year, three, or 75 per cent., were fatal as compared with 86 *per cent.* last year, 55 per cent. in 1911, 93 per cent. in 1910 and 84 per cent. in 1909.

TETANUS FROM INJURIES NOT CAUSED BY FIREWORKS

Besides the cases of lockjaw due directly to the use of fireworks, it is interesting to note also those occurring during the Fourth of July season which were due to penetrating wounds from other causes, such as nails, splinters, crushing injuries, etc. There was a slight reduction in these cases this year, thirty-two cases being reported as compared with forty-four cases last year. Tetanus germs, therefore, were apparently fully as prevalent if not more so this year than in previous years, which makes the marked reduction in recent years of cases from Fourth of July injuries all the more significant and gratifying.

DEATHS AND INJURIES NOT CAUSED BY TETANUS

Besides the three deaths due to tetanus, twenty-nine persons were killed by various forms of fireworks, making a total of thirty-two deaths, nine less than last year, twenty-five less than in 1911 and ninety-nine less than in 1910. This is the lowest number of deaths from such causes during the eleven years covered by the statistics of The Journal, and shows a most significant improvement over previous years. This year eight persons were killed outright by firearms, six by explosions of powder, bombs or torpedoes, one by a cannon and one of blood-poisoning following a slight injury by a large firecracker. The largest number killed by any one cause this year, however, were the thirteen persons, mostly little girls or small children, who were burned to death by fire from fireworks, two of these being reported as due to supposedly harmless "snapper matches." All accidents not due directly to the discharge or handling of fireworks or other means of noise production and display on or about the Fourth of July have been omitted. Table 6 shows a comparison of the causes of deaths aside from tetanus for the past nine years.

DISTRIBUTION OF INJURIES

In Table 7 a summary of all injuries, including tetanus, and of all causes, will be found arranged by states. Beneath the totals at the bottom are given, for comparison, the totals for the ten previous years and the grand totals for the eleven years. Table 8 permits the comparison by states of the total deaths and injuries for ten years. The number of casualties this year was 1,106, an increase of 116 over the total reported last year. In seventeen states the totals this year show an increase over last year, although in most instances the totals are less than two years ago. Pennsylvania had 491 casualties this year, an increase of 226 over last year and 49 more than in 1911. New York had 144 casualties, or 29 more than last year, but 93 less than in 1911. Missouri and Connecticut reported, respectively, 83 and 50 cases this year, the largest totals in those states since 1910. Illinois had only 47 cases as compared with 39 last year and with 218 in 1911. It should be noted that Illinois had 598 casualties in 1906 and 558 in 1908. The figures for the last two years are very small as compared with previous years for California, Illinois, Indiana, Iowa, Massachusetts, Michigan, Missouri, New Jersey, Ohio and Wisconsin. Marked reductions also are seen in New York. Pennsylvania last year had a marked reduction, but still leads in having the largest number of casualties. Of the 491 casualties in Pennsylvania, 340 were reported from Philadelphia.

TABLE 6.—CAUSES OF DEATHS NOT DUE TO TETANUS

Year.	Gunshot.	Fire from Fire-works.	Powder, Tor-pedoes, Etc.	Giant Crack-ers.	Cannon.	Other Causes.	Total
1905	37	23	6	5	7	17	95
1906	38	18	18	3	3	3	83
1907	20	31	13	13	3	22	102
1908	30	22	19	23	7	7	108
1909	17	37	16	7	7	6	90
1910	19	26	11	2	3	3	64
1911	11	12	9	2	5	8	47
1912	9	8	7	2	2	7	35
1913	8	13	6	..	1	1	29
Totals	189	190	105	57	38	74	653

NATURE OF NON-FATAL INJURIES

There were 1,131 non-fatal injuries this year, or 194 more than last year, but 415 less than in 1911. Two persons were totally blinded this year, twenty-two lost one eye each, ten lost legs, arms or hands, and forty-six lost one or more fingers. Although in the last two years there has been a marked reduction in the total number of non-fatal injuries, the totals of these more severe injuries are about the same as reported for the two previous years. The giant firecracker continues to hold the first place as a cause of lacerated wounds and is responsible for most of the losses of eyes, hands and fingers. This year 312 injuries were due to the giant firecracker. Firearms caused 169 accidents this year, including eight killed. Of the total number thus injured many were orderly persons who were struck by stray bullets from the reckless use of firearms by others, and two of these persons died. The use of cannon caused sixty-two injuries, including one killed. In the eleven years, a total of 41,280 people—the equivalent of over forty regiments—were killed or injured in the celebration of the Fourth of July!

TOTALS IN CHIEF CITIES

Table 9 shows the number reported killed and injured in our largest cities during each of the past seven years. The cities are arranged according to their population as given by the United States census in 1910. This table is

TABLE 7.—SUMMARY BY STATES OF FOURTH OF JULY CASUALTIES

Number.	States.	Deaths.			Injuries						Total Persons Dead or Injured.	Causes of Tetanus Cases.		Causes of all Cases Aside from Tetanus Cases.					Number
		From Tetanus.	From Other Causes.	Total.	Loss of Sight.	Loss of One Eye.	Loss of Legs, Arms or Hands.	Loss of Fingers, One or More.	Other Injuries.	Total Non-Fatal Injuries.		Blank Cartridge.	All Other Causes.	Blank Cartridge.	Firecracker.	Cannon.	Firearms.	Powder and Fireworks.	
1	Alabama								1	1	1						1		1
2	Arizona																		2
3	Arkansas																		3
4	California						2	2	18	22	22			1	4	6	3	8	4
5	Colorado								1	1	1								5
6	Connecticut							2	48	50	50			24	6	2	10	8	6
7	Delaware								6	6	6				4			2	7
8	District of Columbia								1	1	1			1					8
9	Florida																		9
10	Georgia								4	4	4				2		1	1	10
11	Idaho																		11
12	Illinois		4	4				2	41	43	47			2	13	4	17	11	12
13	Indiana	1		1	1	1		1	8	11	12	1			4		2	5	13
14	Iowa					1		1	20	22	22				13	1	1	7	14
15	Kansas	1	1	2			1		2	3	5	1			2	2			15
16	Kentucky					1			1	2	2							2	16
17	Louisiana								4	4	4					1		3	17
18	Maine								6	6	6				4		1	1	18
19	Maryland		2	2			1		12	13	15			1	4	1	1	8	19
20	Massachusetts		2	2	1	2		3	34	40	42			3	18	2	9	10	20
21	Michigan		1	1		1	1		18	20	21			1	4	2	3	11	21
22	Minnesota					1			5	6	6				5	1			22
23	Mississippi																		23
24	Missouri					2		1	80	83	83			5	32	3	16	27	24
25	Montana																		25
26	Nebraska							1	16	17	17				9	2		6	26
27	Nevada																		27
29	New Hampshire		1	1					2	2	3				3				28
29	New Jersey		3	3					18	18	21			4	7		4	6	29
30	New Mexico								3	3	3							3	30
31	New York	1	2	3		2		8	131	141	144	2		25	40	9	30	38	31
32	North Carolina																		32
33	North Dakota																		33
34	Ohio		1	1			1	9	59	69	70			8	18	6	8	30	34
35	Oklahoma								1	1	1					1			35
36	Oregon		1	1		1			2	3	4				3			1	36
37	Pennsylvania		9	9		8	2	12	460	482	491			19	100	15	50	307	37
38	Rhode Island		2	2		1	1		17	19	21			1	3	2	6	9	38
39	South Carolina																		39
40	South Dakota																		40
41	Tennessee								3	3	3						2	1	41
42	Texas							1	1	2	2							2	42
43	Utah								1	1	1				1				43
44	Vermont																		44
45	Virginia																		45
46	Washington						1	1	11	13	13			1	5	2	1	4	46
47	West Virginia								3	3	3				1		2		47
48	Wisconsin					1		2	13	16	16			1	7		1	7	48
49	Wyoming																		49
	1913 totals	3	29	32	2	22	10	46	1,051	1,131	1,163	4	0	97	312	62	169	519	
	1912 totals	6	35	41	8	21	13	43	862	947	988	7	0	70	362	75	157	317	
	1911 totals	10	47	57	8	26	30	83	1,399	1,546	1,603	15	3	170	484	114	184	633	
	1910 totals	67	64	131	7	33	26	114	2,612	2,792	2,923	64	8	386	1,050	212	229	974	
	1909 totals	125	90	215	16	36	41	176	4,823	5,092	5,307	130	20	1,095	1,614	427	341	1,680	
	1908 totals	55	108	163	11	93	57	184	5,115	5,460	5,623	58	18	816	1,793	399	481	2,058	
	1907 totals	62	102	164	12	75	57	237	3,868	4,249	4,413	52	21	554	1,489	267	502	1,528	
	1906 totals	75	83	158	22	72	56	227	4,931	5,308	5,466	54	35	925	1,690	408	532	1,822	
	1905 totals	87	95	182	25	106	80	221	4,562	4,994	5,176	65	39	744	1,775	474	404	1,675	
	1904 totals	91	92	183	19	61	61	208	3,637	3,986	4,169	74	25*	831	1,268	508	406	1,057	
	1903 totals	406	60	466	10	75	54	174	3,670	3,983	4,449	363	29†	1,309	1,152	397	236	363	
	Total for eleven years	987	805	1,792	140	620	485	1,713	35,530	39,488	41,280	886	198	6,997	12,989	3,343	3,641	13,226	

* Kind of fireworks causing six tetanus cases unknown. † Kind of fireworks causing 24 cases of tetanus unknown.

of particular interest, since the results in cities in which prohibitive or restrictive ordinances have been adopted can be seen. Prohibitive ordinances were enforced this year in Baltimore, Boston, Chicago, Cleveland, Detroit, Newark, Toledo, Trenton, Washington and elsewhere. Restrictive measures were used in New York, St. Louis, Pittsburgh, Buffalo and elsewhere. Philadelphia reported three deaths this year, Providence reported two, and one each was reported for Chicago, Boston, Baltimore, Pittsburgh and Detroit, making a total of only ten deaths in seven of our eighty-four largest cities, as compared with twelve killed last year, sixteen in 1911, forty-three in 1910 and eighty in 1909. For the last three years Philadelphia is the only large city having more than 100 injuries, having reported 340 this year, a marked increase over last year, when 127 were reported. Altogether 854 non-fatal injuries were reported for these large cities this year, as compared with 522 last year, 771 in 1911, 1,455 in 1910 and 2,935 in 1909. A slight increase over last year is seen in the records of most of these cities, although other cities, notably Chicago, Boston, Detroit and Milwaukee, have kept the returns down to last year's record or show even lower records. Of these eighty-four cities, twenty-five have a record of six or more injured, four more than last year, but twenty-two less than in 1910 and thirty-three less than in 1909. There were thirty-one of these cities which had a clean record this year, as compared with thirty last year, twenty-four in 1911, eighteen in 1910 and eleven in 1909. Probably the most marked reductions in the number of injured in the last few years have been in Chicago, Boston, Milwaukee and Newark. From Newark no casualties have been reported during the last three years, although there were 150 injured and one killed there in 1909. It is noteworthy that nearly two-thirds of all casualties this year were in fifty-three of these larger cities.

TABLE 8.—TOTAL DEATHS AND ACCIDENTS BY STATES DURING TEN YEARS

	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913
Alabama........	7	1	2	1	1	1	3	3	..	1
Arizona.........	..	4	5	2	5	3	..	2	2	..
Arkansas........	..	3	4	..	5	1	4	1	1	..
California.......	138	142	96	121	136	89	63	43	31	22
Colorado........	44	26	23	25	13	18	19	6	21	1
Connecticut.....	133	132	169	63	105	86	78	15	30	50
Delaware........	5	14	8	16	12	13	8	3	6	6
Dist. Columbia..	10	24	5	12	21	..	..	..	2	1
Florida..........	2	2	..	..	..	1	4	..	..	..
Georgia..........	..	..	4	2	4	..	5	10	28	4
Idaho............	4	3	3	4	4	2	3	1	2	..
Illinois..........	423	542	598	468	558	546	285	218	39	47
Indiana..........	211	217	250	..	255	161	167	53	43	12
Iowa.............	137	328	255	231	174	91	141	51	24	22
Kansas..........	88	56	61	64	72	86	50	25	8	5
Kentucky........	72	17	21	18	33	17	26	6	5	2
Louisiana........	2	3	7	8	4	..	4	2	2	4
Maine............	32	29	15	11	16	22	7	4	..	6
Maryland........	22	13	10	23	21	10	8	13	11	15
Massachusetts..	193	467	329	168	430	430	63	27	45	43
Michigan........	157	288	193	163	203	177	143	69	50	21
Minnesota.......	102	174	95	95	65	69	64	17	17	6
Mississippi......	..	..	2	2	1	..	..	1	1	..
Missouri.........	84	218	325	299	375	352	112	60	57	83
Montana.........	17	40	3	6	11	9	10	..	6	..
Nebraska........	63	43	47	58	46	42	36	17	12	17
Nevada..........	1	2	..	1	4	..	1	..	..	..
New Hampshire.	23	9	29	13	13	23	10	2	3	3
New Jersey......	204	350	398	402	472	488	167	43	16	21
New Mexico.....	4	5	1	6	..	1	3	..	..	3
New York.......	549	566	681	752	647	897	327	237	115	144
North Carolina.	..	1	1	..	..	..	1	5	..	..
North Dakota...	8	29	11	8	13	4	13	1	2	..
Ohio.............	327	329	490	375	543	323	166	105	55	70
Oklahoma.......	3	7	14	194	9	12	11	9	11	1
Oregon..........	13	9	11	5	9	21	19	3	5	4
Pennsylvania...	744	721	969	491	987	986	623	442	265	491
Rhode Island....	30	11	21	39	39	42	19	11	2	21
South Carolina.	..	..	1	..	..	4	..	1	..	..
South Dakota...	10	15	5	8	10	9	4	2	..	..
Tennessee.......	1	5	6	4	5	4	10	3	12	3
Texas...........	2	4	11	7	11	4	2	..	3	2
Utah............	22	25	18	30	12	18	8	2	1	1
Vermont........	14	10	14	18	19	12	4	4	1	..
Virginia.........	11	5	8	..	5	..	..	3	1	..
Washington.....	25	15	25	23	38	32	37	22	12	13
West Virginia...	16	34	64	27	29	35	20	2	2	3
Wisconsin.......	215	230	155	150	187	157	171	52	38	16
Wyoming.......	2	8	3	..	1	1	4	4	1	..
Totals.........	4169	5176	5466	4413	5623	5307	2923	1603	988	1163

WHERE THE RESPONSIBILITY RESTS

As has been repeatedly stated in these annual reports, the responsibility for the great majority of Fourth of July injuries clearly rests with city governments, since the employment of death-dealing methods of celebration is subject to their regulation. It is clearly the duty of city authorities, therefore, to decide whether or not the maiming of hundreds, the agonizing deaths from lockjaw and the burning to death of little children by fire from fireworks are to be continued. If fifty-three of these larger cities would do as the other thirty-one have done there would be no casualties to report. Prohibitory ordinances are most effective and permanent, as shown by the results in Baltimore, Cleveland, Newark, Trenton, Chicago, Washington and elsewhere, and even restrictive ordinances, if they could be rigidly enforced, would have good results. But the enforcement of restrictive measures is difficult and requires constant vigilance on the part of the police. By the sound it is difficult to know whether an explosion is due to a firecracker 3 inches long or to one 5 inches long, or whether it is due to some other forbidden form of fireworks. Under the prohibitory ordinance, however, any explosion is recognized at once as a violation of the law. Again, the smaller firecrackers, sparklers and "snapper matches," which have been considered so harmless, caused the fires this year by which several girls or small children were burned to death.

RECENT PROGRESS

It was understood from the beginning that the obliteration of the sorrow and suffering needlessly caused during the annual celebration of the Fourth of July could be brought about only by a campaign of education vigorous enough to change a national custom which had endured for many years and which had its origin in a sincere display of patriotism. It was clear, however, that no patriotism was worthy the name which for its preservation required annually the sacrificing of hundreds and the mutilation of thousands of the youth of the land.

For several successive years The Journal had collected and published the statistics showing the results of the noisy, barbaric celebration of July 4, but apparently with very little effect. In spite of the efforts of The Journal and a few prominent newspapers, notably the Chicago *Tribune*, scarcely any attention was paid to the awful facts. In 1908, however, another table (Table 9) was added to The Journal's statistics, in which the number killed and injured in each of the eighty-four largest cities were shown. It was also shown that the responsibility for these casualties clearly rested with city governments. When the 1908 report was published, reprints were circulated far and wide among newspapers and other publications. The result has been most remarkable. Since that time not only has the press of the country generally taken up the cause, but also local, state and national organizations and societies have become interested. They have not only argued against the use of fireworks, but, more important, have also provided more rational and patriotic means of celebration. An unusually vigorous action has been taken by many city councils during the last few years in the adoption and enforcement of restrictive or prohibitive legislation, and each year these ordinances are growing more and more prohibitive. All of these forces have made most liberal use of THE JOURNAL'S statistics even though they have not always mentioned the source. Be that as it may, however, the result has been a marked reduction in the totals of casualties to a small fraction of what they were in previous years. The necessity of perseverence in this campaign for better methods of celebration is aptly shown by the record of Philadelphia. In spite of a most vigorous campaign which has been carried on during the last three years, that city still reports 340 casualties. A continuance of that campaign, however, will doubtless eventually give that city a better record. Reports received indicate that hundreds of smaller cities and towns, following the example of their larger sisters, are enforcing either restrictive or prohibitive measures. More of such measures should be adopted. More important still, there should be no relaxation in the enforcement of these ordinances such as is indicated by the increase of casualties this year over the number reported a year ago.

TABLE 9.—NUMBER REPORTED KILLED AND INJURED IN THE LARGER CITIES

City.	1907		1908		1909		1910		1911		1912		1913	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
New York City	22	422	11	316	7	559	6	179	3	91	1	58	..	65
Chicago	16	151	12	202	..	118	4	62	2	53	2	12	1	12
Philadelphia	7	248	6	426	9	503	4	405	..	294	2	127	2	340
St. Louis	3	189	4	229	4	163	..	44	..	38	..	48	..	72
Boston	3	59	6	190	5	167	..	35	..	3	..	16	1	15
Cleveland	3	63	12	93	..	4	..	1	..	5	..	1	..	4
Baltimore	..	5	1	10	..	5	..	6	..	10	..	10	1	12
Pittsburgh	10	88	..	30	5	48	6	26	1	25	1	14	1	46
Detroit	2	46	..	10	2	46	1	17	..	18	2	20	1	3
Buffalo	..	18	3	11	..	33	1	13	..	16	..	6	..	16
San Francisco	..	...	..	11	..	12	..	9	1	8	..	7	..	9
Milwaukee	2	93	..	70	..	78	3	112	1	19	..	24	..	10
Cincinnati	2	89	1	112	8	86	8	49	1	4	..	21	..	26
Newark, N. J.	1	120	2	81	1	150	1	15	..	...	..	..	..	...
New Orleans	..	8	..	4	..	...	..	3	..	2	..	2	..	3
Washington, D. C.	..	12	..	21	..	...	..	...	..	...	..	2	..	1
Los Angeles, Cal.	..	35	..	40	..	26	..	...	..	4	..	5	..	6
Minneapolis, Minn.	..	13	..	10	1	21	..	20	..	...	..	...	..	2
Jersey City, N. J.	..	31	5	34	1	14	1	41	..	14	..	3	..	...
Kansas City, Mo.	1	46	..	55	4	67	1	25	..	4	..	1	..	...
Seattle, Wash.	1	3	..	11	3	10	..	7	..	...	..	2	..	2
Indianapolis, Ind.	1	31	1	14	1	35	..	24	..	3	..	6	..	1
Providence, R. I.	..	20	1	21	..	18	..	10	1	9	..	...	2	17
Louisville, Ky.	..	13	..	10	1	10	1	13	..	3	..	2	..	2
Rochester, N. Y.	..	12	..	10	..	5	..	10	..	4	..	2	..	4
St. Paul, Minn.	..	20	..	13	..	18	..	12	..	10	..	7	..	2
Denver, Colo.	..	8	..	13	..	12	1	6	..	2	..	7	..	1
Portland, Ore.	..	2	..	3	..	16	..	13	..	1	..	2	..	...
Columbus, Ohio	5	36	..	5	1	19	..	...	..	1	..	1	..	2
Toledo, Ohio	1	5	..	8	2	3	1	2	..	2	1	1	..	7
Atlanta, Ga.	1	4	..	3	..	...	..	5	..	10	..	28	..	4
Oakland, Cal.	..	9	..	...	..	8	..	9	..	1	..	2	..	...
Worcester, Mass.	1	6	2	20	1	42	..	6	..	1	..	10	..	14
Syracuse, N. Y.	..	20	..	14	..	13	..	6	..	1	..	4	..	15
New Haven, Conn.	..	2	..	...	..	15	..	...	..	1	..	6	..	10
Birmingham, Ala.	..	...	..	...	..	...	..	...	..	3	..	...	..	...
Memphis, Tenn.	..	1	..	3	..	4	..	2	..	...	..	2	..	1
Scranton, Pa.	..	5	1	17	1	29	..	6	..	10	..	...	..	9
Richmond, Va.	..	...	..	...	1	1	..	...	..	...	..	...	..	...
Paterson, N. J.	1	29	2	31	1	45	1	14	..	5	..	2	..	4
Omaha, Neb.	..	25	..	10	1	17	..	17	..	7	1	2	..	16
Fall River, Mass.	..	...	..	12	..	19	..	1	..	...	..	1	..	...
Dayton, Ohio	..	11	..	14	..	4	..	2	..	4	..	1	..	...
G. Rapids, Mich.	..	20	1	30	..	3	..	17	1	6	..	9	..	13
Nashville, Tenn.	..	2	..	...	..	...	..	8	..	2	..	10	..	2
Lowell, Mass.	..	23	..	...	..	18	..	...	1	3	1	...	..	...
Cambridge, Mass.	..	...	..	17	..	...	..	...	..	4	..	...	..	...
Spokane, Wash.	..	...	..	...	..	...	..	...	..	7	..	4	..	8
Bridgeport, Conn.	..	1	..	27	..	21	..	4	..	4	..	1	..	3
Albany, N. Y.	1	24	..	37	..	31	..	11	1	5	..	...	..	4
Hartford, Conn.	..	18	..	18	..	11	..	14	..	1	..	9	..	27
Trenton, N. J.	..	38	1	17	1	59	..	...	..	1	..	...	..	1
New Bedford, Mass.	..	...	..	3	..	...	..	...	..	...	..	...	..	...
Reading, Pa.	..	17	..	13	..	17	1	3	..	4	..	3	..	21
San Antonio, Tex.	..	...	..	1	..	...	..	...	..	...	..	...	..	...
Camden, N. J.	..	16	..	29	4	14	..	6	..	...	1	...	..	...
Salt Lake City	..	15	..	6	2	14	1	4	..	...	..	1	..	1
Lynn, Mass.	..	3	..	11	3	16	..	4	..	...	..	2	..	...
Springfield, Mass.	..	21	1	36	1	9	1	2	..	4	..	...	..	1
Wilmington, Del.	1	14	..	13	3	9	..	6	..	3	..	5	..	6
Des Moines, Iowa	1	31	..	41	..	13	..	23	..	12	..	...	..	6
Lawrence, Mass.	..	11	1	...	5	22	..	...	..	...	..	...	..	...
Tacoma, Wash.	2	4	1	3	..	3	..	2	..	...	..	1	..	...
Kansas City, Kan.	1	10	..	17	..	33	..	14	1	5	..	...	..	...
Yonkers, N. Y.	..	32	..	5	..	8	..	...	..	4	..	...	..	...
Houston, Texas	..	...	..	1	..	1	..	...	..	...	..	...	..	...
Duluth, Minn.	..	13	..	9	2	10	..	3	..	1	..	...	..	...
St. Joseph, Mo.	1	23	1	41	1	24	..	11	..	1	..	...	..	...
Somerville, Mass.	..	...	..	...	..	1	..	2	..	...	..	1	..	...
Troy, N. Y.	..	...	2	18	..	16	1	8	..	2	..	1	..	1
Utica, N. Y.	..	18	..	10	..	5	..	1	..	...	..	...	..	2
Waterbury, Conn.	2	8	..	14	..	5	..	15	1	...	..	...	..	1
Schenectady, N. Y.	..	4	..	20	..	8	1	13	..	7	..	...	..	1
Hoboken, N. J.	..	1	1	24	..	7	..	4	..	...	..	1	..	...
Elizabeth, N. J.	..	43	..	72	..	37	..	15	..	1	..	...	..	...
Manchester, N. H.	..	3	..	1	1	5	..	...	..	...	..	1	..	1
Evansville, Ind.	..	5	..	12	..	6	..	7	..	1	..	...	..	...
Norfolk, Va.	..	...	..	...	..	...	..	...	..	...	..	...	..	...
Wilkes-Barre, Pa.	1	...	3	33	1	15	2	8	..	2	..	5	..	...
Peoria, Ill.	..	8	..	27	1	22	1	17	..	...	..	2	..	...
Erie, Pa.	..	...	..	1	..	4	..	2	..	3	..	1	..	1
Savannah, Ga.	..	...	..	...	..	...	..	...	..	...	..	...	..	...
Harrisburg, Pa.	..	23	1	71	..	22	..	3	..	1	..	...	..	...
Portland, Maine	1	2	..	...	..	2	..	...	1	2	..	...	..	1
Totals	94	2,458	83	2,860	80	2,935	43	1,455	16	771	12	522	10	854
Totals elsewhere	70	1,791	80	2,600	135	2,156	88	1,337	41	775	29	423	22	309
Grand total	164	4,249	163	5,460	215	5,091	131	2,792	57	1,546	41	945	32	1,163

THE METHOD OF SUBSTITUTION

Better by far than the mere negative methods of restriction or prohibition, however, has been the extensive agitation by various societies for more sensible methods of celebration. Our national Independence Day must cease to be a day of destruction and become a day of recreation, joy and enlightenment. From many of our larger cities comes the news that instead of the ear-splitting din of former years, those cities this year were more quiet than on an average Sunday. In many cities special celebrations and parades have been tried. The display of flags, the music of bands, the children's parade, the witnessing of historic floats, the picnics, the trips to the parks and visiting of friends—these methods are surely a more fitting and patriotic way of celebrating the day than by the senseless din and destruction of former years. And the result of such methods is evident: the smallest number of lockjaw cases and other deaths reported in any year since THE JOURNAL began the collection of these statistics, fewer blinded eyes, fewer maimed bodies and an astonishing reduction in the number of injuries. There are still too many of these injuries, however, and this year in an increased number. The campaign must be continued until the nation's disgrace shall be entirely removed.

Reduction of Rent per Child.—Professor Broca of Paris has been instrumental in the founding of a Paris company which owns tenements to rent to families with children exclusively. With three children under the age of 16 the rent is reduced by 20 per cent. of the rent-rates current in the vicinity. A further reduction of nearly five dollars a year is made for each additional child under 13; of three dollars for each additional child between 13 and 14, and of about two dollars for children between 14 and 15. This plan puts a premium on large families, and seems to be working finely, the owners of the property being content with the 3 per cent. income when property around, not granting the reduction, brings in a larger revenue. Broca recently reported at the annual meeting of the society in question that the mortality in its tenements was only from 5.9 to 14.4 per thousand, while in similar quarters elsewhere it ranged from 18 to 25 per thousand. The official title of the organization is the Société des logements économiques pour familles nombreuses (Society to provide economical dwellings for large families). The tenements are of the type that rent usually for from $70 to $100 or $150 a year.

THE JOURNAL OF THE
AMERICAN MEDICAL ASSOCIATION

535 Dearborn Avenue . . . Chicago, Ill.

Cable Address . . . . "Medic, Chicago"

Subscription price . . . . . Five dollars per annum in advance

Contributors, subscribers and readers will find important information on the second advertising page following the reading-matter.

SATURDAY, AUGUST 30, 1913

THE FOURTH OF JULY IN 1913

Another Fourth of July has been celebrated; the returns are now all in; all cases of lockjaw that have developed from such injuries have been checked up; all fatalities have been investigated and the results have been tabulated. These results appear this week on another page.

DEATHS FROM FIREWORKS

The fatalities this year were not so numerous as last year, there being only thirty-two deaths from fireworks as compared with forty-one last year, 215 in 1909 and 466 in 1903. Only 3 of these deaths were due to tetanus as compared with 6 last year, 125 in 1909 and 406 in 1903. These marked reductions in fatalities and in the numbers of tetanus cases give the best evidence that the old-time barbarous celebration is about over.

TOTAL CASUALTIES

This year the total number of casualties including the non-fatal injuries was 1,163, as compared with only 988 last year, with 1,603 in 1911 and with 5,623 in 1908, when the highest number of casualties was reported. There was an increase, therefore, over the total for last year although a decrease below the totals reported in all previous years. It is interesting to note, however, that over 40 per cent. of all casualties were in Pennsylvania, which reported 491 injuries, including nine deaths. It is also interesting to note that of this total reported for Pennsylvania 340, or nearly 70 per cent., occurred in the city of Philadelphia. The citizens of Philadelphia, the birth-place of independence, always have been a demonstrative people, but unlike the country generally, they have failed to note that, hiding behind the fair name of patriotism, the celebration of Independence Day has degenerated into a disgraceful demonstration of lawlessness and disorder. The awakening appears near at hand, however, since during the last few years a vigorous campaign against the use of fireworks has been carried on by some of its most progressive citizens. The force of public opinion is already bringing results, since an ordinance prohibiting the use of fireworks was said to have been passed this year, although the increased number of injuries reported would indicate that little if any attempt was made to enforce it. A vigorous enforcement of that ordinance, therefore, would have done much to remove a disgrace not only from the fair city of Philadelphia, but also from the state and the entire nation. Outside of Pennsylvania there were only 672 casualties this year and only one other state, New York, reported more than one hundred injuries. In 1908 there were thirteen states reporting an average of nearly four hundred accidents each.

EVIDENCES OF PROGRESS

The returns this year show a decided progress, taking the country as a whole. A larger number of cities adopted prohibitory ordinances and many of the largest —Chicago as an example—reported the day as more quiet than the average Sunday. The people of these cities seem to have gladly welcomed their deliverance from the annual debauch of noise and destruction and have taken advantage of the parks, the bathing-beaches, the country or other places where the day could be enjoyed in quiet and in safety. After all, the chief objections to sane-Fourth ordinances came from those financially interested and from the hoodlum element which needed to be suppressed. In marked contrast with former years, there was in these cities little evidence of the use of fireworks, and the emergency hospitals and fire departments had almost nothing to do. On the other hand, flags, bunting, red-white-and-blue suits and parasols were everywhere in evidence. Most important, however, the enjoyment of the celebration was not marred by the usual aftermath of deaths, injuries and sorrow.

BEGINNING OF THE CHANGE

Eleven years have passed since The Journal began publishing annually reliable statistics concerning the awful cost in life and limb of the use of explosives in celebrating the Fourth of July. For six long years the reports seemed to have no effect in spite of the fact that pamphlets containing the statistics were widely circulated each year among civic officers and others. The appeals for saner methods of celebration seemed, with few exceptions, to fall on deaf ears. One of the most notable exceptions was the Chicago *Tribune,* which had for years carried on a propaganda of its own against the unnecessary toll of blood exacted by the "insane" Fourth. Finally in the report of 1908 The Journal began showing the casualties occurring in our largest cities. The figures revealed that a large majority of the deaths and injuries was clearly due to the lawlessness and disorder permitted in these cities. The corollary was also clear that the city governments were responsible for these deaths and injuries inasmuch as they could be prevented by the enforcement of restrictive or prohibitive ordinances. That report seemed to touch local pride; the press generally began publishing The Journal's statistics, naturally emphasizing the figures of the local city and state; civic and other organizations started campaigns for the suppression of fireworks and the encouragement of other methods; city councils and officers were stimulated to action, and since that year the progress for better methods of celebration has been remarkable.

SIGNIFICANCE OF THE CHANGE

The watchword of this country is individual liberty, and this was heralded to the world by the Declaration of Independence, the signing of which is celebrated, July 4. The manner in which this day has been celebrated is, therefore, a fair index of other tendencies in our national life. From the beginning the individual was left free to show his patriotism on July 4, just as he was given the largest freedom in religion, in business and in the other walks of life. Too much freedom led to abuses in the business world, even as too much liberty led to disorder and lawlessness in the celebration. The nation has had to learn that the greatest liberty to the greatest number demands that certain bounds be placed to the liberty of the individual. Only a few years ago there seemed to be many evils due to greed, political favoritism and special privilege, such as to threaten the very continuance of our government. Within the last few years, however, much publicity has been given to political and commercial trickery in high places and low, and as a result we see a decided trend toward better things.

The use of fireworks in the celebration of the nation's birthday undoubtedly began as a sincerely patriotic demonstration, and celebrators were left free to do as they chose. This liberty became more and more abused, however, until the celebration had degenerated into an annual orgy of lawlessness, rowdyism, noise, death and destruction. So fixed had become the habit of celebrating with fireworks, and so general had become the freedom of their use, that even babes were suffered to handle matches and fireworks so often deadly even to adults trained to use them. Worse and worse grew this pseudopatriotic orgy until it was annually demanding a toll of hundreds of children to be tortured by lockjaw, burned to death or otherwise slain, and thousands of others were blinded, maimed for life or otherwise injured. So settled was the nation in this annual debauch as to require the awful results to be given publicity time and time again through six long years before any appreciable check could be put to these crimes being committed annually in the name of patriotism! But as in other walks of life progressive citizens are successfully struggling for civic, state and national righteousness, so these forces are also making effective use of the statistics collected by THE JOURNAL and successfully striving to bring in a safer, more dignified and more truly patriotic celebration of the Fourth of July.

THE SEVENTEENTH INTERNATIONAL MEDICAL CONGRESS

In reviewing the Seventeenth International Medical Congress, one is first impressed with wonder at its stupendous size. No fewer than twenty-five separate governments sent official representatives, and between seven thousand and eight thousand members attended. Of these it is worthy of note that quite a considerable proportion were women, about eighty of them from English-speaking countries. This fact marks a significant change that has come over professional opinion since the time when the Congress last met in London, in 1881. On that occasion the Executive Committee decided to issue invitations to men only, with the result that "forty-three duly qualified medical women" entered a protest, drawing on themselves the following rebuke from the *Lancet:* "It is well to bear in mind that the Congress is a voluntary assemblage of medical men for a certain purpose, and that those who are not asked to join suffer no infringement of their rights."

Another comment by our estimable contemporary of that date which touched us more nearly, was the remark that almost the whole of the work in the pathological section was done by German, French and English members, "while the Americans, who were present in large numbers and took an active part in the work of other sections, furnished only a single short communication, so little is pathology even yet studied by American doctors." That stricture, if correct at that time, could certainly not be leveled against the American profession of to-day, for beside those who actually read papers or took part in the proceedings of the Sections of Pathology and Bacteriology—among whom are to be found Yandell Henderson, MacCallum, Warthin, Folin, H. Dakin, and Duval—were many physicians in the various sections whose pathologic work is well known.

A feature of great and encouraging interest in connection with the Congress was the large amount of space devoted by the leading daily newspapers, particularly the *Times* and the *Morning Post,* the *Daily Telegraph* and the *Standard,* to fairly accurate reports, not only of the social aspects and the principal addresses and burning topics, but even to the section work generally, at any rate in regard to such matters as could conceivably be deemed of public interest.

Particularly is it gratifying to note that at last the "conspiracy of silence," which has for so long prevailed over all attempts on the part of the profession to arouse the public mind to the venereal peril, has been overcome; and the important resolution passed by the Congress has been not only widely disseminated, but also commented on and generally approved. That resolution, after calling attention to the ravages caused by syphilis, urges the governments of all the nations represented at the Congress to institute confidential notification of syphilis to a sanitary authority, and to make systematic provision for the diagnosis and treatment of all cases of syphilis not otherwise provided for. It is also gratifying to learn on good authority that so far as the British government is concerned, it has acquiesced in the proposition, as was indeed foreshadowed in Lord Morley's speech at the government dinner to the Congress.

Yet another auspicious feature of the Congress was the greater extent of official recognition than has hitherto been accorded to such gatherings, in the dinner given by the government to the more eminent representatives of the Congress, at which Lord Morley, a high government official, speaking on behalf of the government, dwelt on the relations between the state and the medical profession, regarded as a potent factor in shaping public policy. He especially recognized the powerful influence that can and ought to be wielded by those attending the Congress toward the establishment of international amity and the suppression of those jealousies, fears and misunderstandings which imperil the peace and prosperity of nations.

While so many points mark progress in a proper estimation of the ideals of the medical profession, in one point at least there is a striking similarity between the conditions surrounding the two congresses. In 1881, as now, misguided persons were vigorously attempting to check the progress of medicine and science by restrictive or prohibitory legislation against experiments on living animals. Then, as now, men of practical knowledge pointed out clearly the actual benefits that had been derived from such experiments and indicated the deadly blow to all progress in medicine that the success of such attempts would entail. But how much greater, how much more overwhelming, is the mass of accumulated evidence that can be adduced to-day of the continuous stream of benefit to the human race—aye, even to animals—that has flowed, and is flowing, from animal experimentation. The cautionary remarks of Lord Morley at the government dinner, August 5, in which he referred to "the strong opinion prevailing in this country against experiments on living animals" was countered the next day, when Sir Ernest Schäfer, professor of physiology at Edinburgh University and president of the Section on Physiology, submitted the resolution which was there carried unanimously and subsequently endorsed at the closing meeting of the entire Congress:

> Experiments on living animals have proved of the utmost service to mankind in the past and are indispensable to its future progress, and accordingly, while deprecating the infliction of unnecessary pain, it is of opinion, alike in the interests of man and of animals, that every facility should be given to competent persons for the performance of such experiments under adequate supervision.

Not only this, but Harvey Cushing's brilliant address in surgery contained a well-reasoned and vividly illustrated argument and an emphatic protest against restrictive legislation which would seriously impede, if it did not entirely arrest, the progress of medical knowledge.

Finally, as to the hospitality accorded by our confrères of the British Empire to their guests and colleagues, it cannot be more suitably expressed than in the words used by the permanent commission in its report, "that it surpassed all expectations."

THE THERAPEUTIC RANGE OF SALVARSAN

It is not the intention now to discuss the therapeutic effects of Ehrlich's salvarsan and neosalvarsan in syphilis. Experience has shown that even under the most favorable conditions a *therapia magna sterilisans* cannot be secured uniformly in this disease by means of one or two injections of the remedy. Because high expectations were allowed to arise this partial failure of salvarsan to reach the utmost theoretic therapeutic ideals has had a tendency to create doubt in some persons as to the ultimate success of remedies built up experimentally in the way that salvarsan was produced. It will require years of experience and observation before the accurate range and limits of action of salvarsan and neosalvarsan in syphilis—the special indications, the limitations and the dangers—are established fully, and though they may fall short of what was hoped of them in syphilis, it always should be kept in mind that salvarsan does effect what must be accepted as a complete *therapia magna sterilisans* in certain human diseases. This is true of recurrent fever which is caused by a variety of spirochete. In a few hours after the injection of salvarsan the parasites disappear from the blood and crisis occurs followed by prompt recovery without recurrence. It is true also of frambesia or yaws, the tropical disease which resembles syphilis and is caused by a spirochete. Here a single injection is usually enough to cause a complete cure. In Surinam a hospital which usually cared for about three hundred patients with frambesia has been closed because of the rapid cure thus produced. In view of what actually is accomplished in the way of rapid and complete sterilization in these human infections there is no room for doubt and distrust of the possibilities of Ehrlich's method. And it does not seem likely that the therapeutic range of salvarsan is limited to syphilis, recurrent fever and frambesia. Numerous infectious diseases of different nature are said to be favorably influenced by its use (scarlet fever, small-pox, glanders, etc.), but no final conclusions can be based on the observations now at hand. Vincent's angina and other lesions due to oral spirochetes appear to be cured rapidly by salvarsan; in some cases local applications are sufficient. Aleppo boil and other diseases caused by organisms of the Leishmania group are also said to yield to salvarsan, and recently its use in amebic dysentery has been followed by strikingly favorable results (Hata,[1] Wadhams and Hill[2]); but here also further trials are necessary before any final judgment can be pronounced. There seems, then to be good reasons for the evidently increasing interest in what salvarsan and neosalvarsan may do in other diseases than syphilis, and if the therapeutic powers of these agents, the first finished product of the method used by Ehrlich in their discovery, are such as indicated, what shall we think of the further possibilities of the method itself?

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1. Hata: Quoted by Ehrlich: Chemotherapie, Vortrag, Oct. 24, 1912.
2. Wadhams, S. H., and Hill, E. C.: Three Cases of Amebic Dysentery Treated with Salvarsan, The Journal A. M. A., Aug. 9, 1913, p. 385.

THE ADMINISTRATION AND VALUE OF TETANUS ANTITOXIN

The growing practice of giving tetanus antitoxin for curative purposes by the intraspinal route receives increasing support from both the statistical and the experimental sides. Numerous observers have corroborated the findings of Meyer and Ransom and others that the tetanus toxin is absorbed from the infected wound along the nerves, and spreads into and through the spinal cord by direct extension. Toxin traveling along the nervous tissues is not readily neutralized by antitoxin in the blood, but antitoxin in the spinal fluid can meet the toxin in the nerve roots, and probably in the cord itself. A series of interesting studies by Permin[1] establishes these facts and adds some new ideas. He found that animals given large doses of tetanus antitoxin, and then injected into a muscle with three or four times the ordinary lethal dose, develop a local tetanus from the excess toxin which passes along the nerves and reaches the regional segment of the spinal cord without being neutralized. Intraspinal injection of antitoxin can prevent the passage of the toxin into the cord, and thus prevent the local tetanus. As others have done, Permin attributes the universal tonic spasm of general tetanus to multiple ascending spasms; but the convulsions he ascribes to irritation of the cerebrum, on the basis of experimental evidence obtained from decerebrated animals, and by intra-ocular injection of the toxin.

Antitoxin circulating in the blood after subcutaneous or intravenous injection has no demonstrable power to abstract tetanus toxin from the nervous tissue, and hence is powerless to prevent the action of this toxin. All that antitoxin can do is to saturate the toxin being formed in the site of infection before it has entered the nervous tissues, and thus prevent in some cases the absorption of the fatal dose. When present in the spinal canal the antitoxin can also neutralize the toxin which is being carried into the cord from the nerves, thus interrupting the poison before it reaches the place where its harmful action is developed. The prophylactic use of antitoxin depends on the binding of the toxin before any toxic quantity can be absorbed by the nervous tissues, and apparently is not associated with any considerable effect on the infection, in view of the reported cases in which a delayed tetanus has been observed after prophylactic use of antitoxin, presumably arising after all the injected antitoxin has been eliminated or neutralized. From the results of experimental studies, which are supported by such statistical evidence as is obtainable, the proper curative treatment in a case of actual tetanus should consist, in addition to radical cleansing and extirpation of the infected tissues and symptomatic sedative treatment, of the use of maximum quantities of tetanus antitoxin by both intraspinal and intravenous or subcutaneous routes—the former to block the passage of antitoxin from the nerves into the spinal cord, the latter so to saturate the blood and tissues with antitoxin that no more unbound toxin can enter the nerves. Patients so treated, who have not already a fatal quantity of toxin in their spinal cords, should recover in most if not all cases.

Statistics on the use in Denmark of tetanus antitoxin for curative purposes, largely by the simple subcutaneous route of administration, give encouraging results, which would probably be even better if the more vigorous methods were employed. Of 199 patients treated without antitoxin there were 21 per cent. of recoveries, while in 189 cases of quite similar incubation period in which antitoxin was given, 42.3 per cent. of the patients recovered. It is especially noteworthy that in the acute cases with an incubation period of less than ten days, which have a notoriously bad prognosis, ninety-two patients treated with antitoxin showed 27.2 per cent. of recoveries, while of ninety-four untreated patients only 5.3 per cent. recovered. If tetanus antitoxin has so much influence on mortality when it simply limits absorption from the wound, its effect will undoubtedly be much greater when it is also used to block the progress of the toxin already absorbed. In any case, the results of these and many other statistical studies leave no room for doubt that tetanus antitoxin is well worth while as a curative agent in developed cases. In its use as a prophylactic agent it must always be kept in mind that tetanus antitoxin does not remain long in the body; Ruediger[2] found that in guinea-pigs the protective influence is lost in three weeks, while Vaillard[3] states that in man it lasts but one or two weeks. Hence, in those cases in which complete removal of the infecting bacilli cannot be assured, a repetition of the injection is necessary. Cases of tetanus developing some weeks after prophylactic use of antitoxin are occasionally observed, and are undoubtedly due to neglect of this precaution.

WHAT IS A DIABETIC FOOD?

In another column we refer to the report on diabetic foods just issued by the Connecticut Agricultural Experiment Station. A discussion of these products naturally raises the question of "standards" and definitions, among the complicated meshes of which the unscrupulous may dodge just dietary demands even if they do not directly violate legal requirements. Naturally in this connection the question arises: What constitutes a "diabetic" food? Street and Mendel[1] point out that formerly an almost complete absence, or at least a marked reduction of carbohydrate was considered an essential characteristic of a true "diabetic" food. The advertising literature and labels of the manufacturers of food products sold specifically for diabetics almost without exception foster the belief that their preparations, if not entirely free from carbohydrate, are at any rate far lower in carbohydrate content than are ordinary foods of the same class. Some manufacturers have more recently taken advantage of the fact that certain practitioners of recognized authority sanction the temporary liberal use of starchy foods like oatmeal, potato or rice for the very special purpose of increasing carbohydrate tolerance, to intimate the desirability of having a certain amount of starch in diabetic foods. This is at best a poor excuse for a low-grade product; for there is in truth *no occasion to purchase special foods for the diabetic* if the problem at issue is merely one of an insignificant reduction in the carbohydrate intake. The mere curtailment of the amount of ordinary bread or cereal eaten will accomplish the same end without dietetic discomfort. Furthermore, the sole guide which the purchaser at present has in the selection of brands of diabetic foods is the occasional indication of their protein content. High protein is by no means necessarily coincident with low carbohydrate. A product may be two-thirds protein and still contain 30 per cent. of objectionable carbohydrate, whereas a competing product may have the non-protein deficit made up completely of desirable fat. The physician and the patient are to-day utterly at a loss to know the true carbohydrate content of most of the foods offered to them. In fact, so great has this uncertainty become, that many leading practitioners have abandoned the use of all special preparations, preferring greatly reduced allowances of staple products like ordinary bread, of which the carbohydrate content is known and subject only to slight variations.

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[1] Permin, Carl: Tetanusstudier. Experimentelle og kliniske Undersögelser over Stivkrampens Pathogenese og Therapi, Habilitation Thesis, Copenhagen, 1912.

[2] Ruediger: Bull. Manila Med.

[3] Vaillard: Bull. de l'Acad.

[1] See Footnote 2, p. 689.

Street and Mendel insist that when a manufacturer offers a preparation as particularly suited for the use of diabetics, he removes that product from the category of ordinary foods and assumes new obligations to the consumer. The conditions surrounding its sale must necessarily be more exacting than for an ordinary food sold for ordinary purposes. They therefore propose that the following restrictions should apply to any preparation sold specifically as a "diabetic" food: 1. It should contain much less carbohydrate than is found in a normal food of the same class—certainly not over half as much. 2. The label should bear a correct statement of the percentages of protein, fat and carbohydrates present. 3. The amount of the different carbohydrates present should be declared on the label, that is, starch, sucrose, levulose, lactose, etc. 4. The processes of manufacture should be so standardized that uniformity of composition, within reasonable limits, will be maintained from year to year. 5. No statement should be placed on the label which would give the impression that any food in unlimited quantity is suitable for a diabetic patient. 6. In the advertisements of these foods emphasis should be put on the carbohydrate content rather than on the amount of protein present.

Unless something is accomplished in the near future in the way of following some or all of these suggestions, which seem both reasonable and logical, so-called diabetic foods must remain the object of uncertainty and suspicion and likewise fail, as a class, to appeal to discriminating physicians and well-advised patients as having any special therapeutic virtues. It is further particularly to the interest and advantage of the few producers of satisfactory products to protect themselves from the undeserved suspicion which their unscrupulous competitors force on them by a sort of legalized indifference and fraud.

Current Comment

COMMERCIALIZING THE INTERNATIONAL CONGRESS

The Seventeenth International Congress of Medicine has come and gone. As in all such cases, the congress itself and the exhibit held under its auspices will be used as advertising assets by firms and individuals who feel the need of something in that line. A letter (third-class mail) has been received addressed to "Monsieur le Docteur Directeur de The Journal of the American Medical Association." Enclosed were five sheets of thin paper each one of which bore the caption "17e Congrès international de Médecine, Section de Chirurgie, soussection d'Orthopédie." Each sheet—written in French—detailed the part that Monsieur Mencière of Reims played in the section of orthopedic surgery, describing as he did by means of wall charts (*planches murales*) his technic of "phéno-puncture" in "coxalgie douloureuse." Reference is also made to Mencière's "auto-modeleur à pression pneumatique," a piece of apparatus that the gentleman doubtless wants brought to the attention of the profession of medicine the world over. A thirst for publicity that inspires a physician to send broadcast to the medical journals of the world a synopsis of his remarks at a scientific meeting is so frank, so ingenuous, so childlike, that it disarms criticism.

Later: As we go to press we have received one more letter—still third-class mail—from Dr. Mencière. This informs us that on Aug. 6, 1913, at 3 o'clock, the gentleman described his operative technic by means of stereopticon slides (*avec projection*) before the Orthopedic section of the International Congress!

VERRUCA TRANSMISSION

A preliminary communication from Peru[1] has brought a suggestion that may solve the problem of verruca transmission. Dr. Townsend, who is engaged in the study of the Peruvian disease at Chosica, Peru, has come to the conclusion that a theory of tick transmission is at present untenable. The investigation of the distribution of various bloodsuckers occurring in the verruca zone must take account of the peculiar distribution of the disease, which is said to be confined to deep and narrow canyons, with much vegetation, heat, and little or no ventilation. It appears that the habits of *Phlebotomus* correspond minutely with the conditions of verruca occurrence and the verruca zones. The flies find ideal conditions for their breeding in the verruca canyons. They suck the blood of almost any warm-blooded animal and thus are quite independent of man. This accords with the verruca reservoir being located in the native fauna. Dr. Townsend announces his confident belief that the transmission experiments, now about to be initiated with these gnats on laboratory animals, will demonstrate their agency in the transmission of the disease. We expect shortly to publish a report by Townsend of these experiments.

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[1] Townsend, C. H. T.: A Phlebotomus the Practically Certain Carrier of Verruca, Science, 1913, xxxviii, 194.

A REPORT ON DIABETIC FOODS

The subject of diabetic foods is one which THE JOURNAL has discussed at various times in the past in the hope not only of furnishing reliable guidance to those physicians who are interested in the management of diabetes, but also of awakening a much needed reform in the character of the manufactured products sold as diabetic foods. The subject is of vital importance to diabetics and to physicians who want to treat these unfortunates in a scientific manner. A while ago we published a brief preliminary survey of the diabetic foods on sale in the United States.[1] The detailed report, prepared by J. P. Street, chemist of the Connecticut Agricultural Experiment Station, and Lafayette B. Mendel of Yale University, has now appeared.[2] We do not know of any work done on this subject which compares in thoroughness and usefulness with this detailed report from the Connecticut Agricultural Experiment Station. Every physician who is interested in the subject of flours and foods having, or supposed to have, a low carbohydrate content, and certainly every physician who has a diabetic patient, should send for it.

CORPUS LUTEUM AND MAMMARY GLAND

It has been well established that the mammary glands may begin to hypertrophy during pregnancy after complete division of all the possible nervous paths between them and the tissues more directly involved in the developmental changes, namely, the ovaries and uterus. Starling and Lane-Claypon demonstrated that a somewhat similar mammary hypertrophy may be found in virgin rabbits after the injection of watery extracts made from fetal rabbits. This observation forms the basis for the current "hormone" theory regarding the initiation of growth in the mammary glands during pregnancy, for it points clearly to the fact that a chemical substance—a hormone—produced in the fetus and transmitted through the placenta to the maternal blood-stream may become an essential factor in the initiation of mammary development before lactation. This fetal hormone is not the only factor involved in the growth of the mammary gland. Bouin and Ancel[3] have furnished evidence that the corpus luteum—the tissue produced when a follicle of the ovary is ruptured and an ovum discharged—may also be concerned in the development of the mammary gland and lead to its hypertrophy quite independently of the presence of actual products of conception in the uterus. The rupture of ripe follicles can often be induced by purely mechanical or artificial means. The French investigators have shown that this is ordinarily followed by the formation of corpora lutea and also by a growth of the mammary glands. Recent experiments of O'Donoghue[4] in the main confirm this interesting finding of Bouin and Ancel. They further provide a valuable piece of negative evidence. According to O'Donoghue, the rupture of the follicles is not invariably attended by the formation of corpora lutea. When the formation duly occurs there is also a growth of the mammary glands. In rabbits, the amount of growth in fourteen or fifteen days was about equal to that of the normal pregnant female of twelve days. On the other hand, if the follicular rupture is not succeeded by the formation of corpora lutea, then no growth of the glands ensues even though the operative procedures have been precisely the same in the two cases. These facts serve to lend new emphasis to the dependence of such physiologic responses as mammary development on other than purely nervous relations. They add to the coming significance of hormone activities in the interdependence of various parts of the organism.

ENCOURAGEMENT

The attempt of a philanthropic gentleman in the coal business to enrich—for a consideration—the armamentarium of physicians is discussed briefly in the Propaganda for Reform department. The thing itself is but a trivial episode in contemporaneous quackery, yet the matter has been one of special encouragement. Had this same scheme been worked six or eight years ago, it is doubtful whether half a dozen physicians would have taken the trouble to bring the matter to THE JOURNAL'S attention. To-day, apparently as a matter of course, more than half a hundred wide-awake members of the profession, in one state, immediately bring this attempt to exploit the doctor to the notice of their own journal. Such spontaneity of action is decidedly encouraging.

HAPGOOD RUNS TRUE TO FORM

The aforetime readers of *Harper's Weekly*—the oldest illustrated weekly newspaper in the country—will hardly recognize it under its new ownership and editorship. The change is radical; everything is new but the name: typography, make-up, arrangement—all are different, and better. But the greatest difference is in the character of its contents—and of course this might have been expected with Norman Hapgood as editor. *Harper's Weekly* is no longer mainly political; it is so only incidentally. As its subtitle has already had it, it is indeed again "a journal of civilization"; or probably it would be better to say *"for* civilization." This comment, however, is mainly to call attention to, and to quote from, one item in the initial number under Mr. Hapgood's editorship. After referring to the many letters that the editor had received asking that "both sides" be given in the vivisection controversy, and stating that if a course hostile to the antivivisection crusade were pursued the writers would not subscribe, *Harper's Weekly* says:

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[1] Street, J. P.: Diabetic Foods Offered for Sale in the United States, THE JOURNAL A. M. A., June 28, 1913, p. 2037.

[2] Street, J. P., with the assistance of Mendel, L. B.: Diabetic Foods, Report Conn. Agric. Exper. Sta., Food Products and Drugs, 1913, Part 1, Section 1. This report is available free to those who apply to the Connecticut Agricultural Experiment Station, New Haven, Conn.

[3] Bouin, P., and Ancel, P.: Sur la fonction du corps jaune, Compt. rend. Soc. de biol., 1909, lxvi, 605, 689.

[4] O'Donoghue, C. H.: The Artificial Production of Corpora Lutea and Their Relation to the Mammary Gland, Jour. Physiol., 1912, xlvi, 6.

> We have no intention of giving both sides. On the contrary, the support of the cause of scientific medical progress will be one of the things to which we shall be energetically devoted. We shall no more give both sides of the argument on experiment than we shall give both sides of the question of whether the household fly shall be encouraged in the dining-room, or sewers emptied into the city reservoir, or swamps kept for the breeding of mosquitoes, or small-pox patients permitted to ride on the street-cars. We shall be extremely bigoted on the subject, and shall hope that the day will soon come when cancer will be added to the great diseases that have yielded to investigation.

We congratulate Mr. Hapgood on the fact that he has the courage of his convictions and is not afraid to express them. Also, we congratulate him on the various good things he has introduced into this *new* journal published under an old name.

Medical News

ALABAMA

Hospital Cornerstone Laid.—The cornerstone to the addition to the Hillman Hospital, Birmingham, was laid with Masonic rites, August 26.

Hospital Addition Completed.—The addition to the Mobile City Hospital which will accommodate eighty patients, is nearly completed. The building is two hundred feet long and connected with the present hospital building by a corridor. On the ground floor an out-patient department and x-ray, clinical and anatomical laboratories are provided.

Personal.—Dr. Andrew H. Ryan, formerly professor of physiology and pharmacy in Washington University, St. Louis, and more recently assistant professor of physiology and pharmacy in the University of Pittsburgh, has accepted the professorship of physiology in the School of Medicine in the University of Alabama, Mobile. Dr. Howard H. Bell has been appointed full-time assistant in the department of pathology and bacteriology in the university and Dr. Jesse P. Chapman, assistant instructor in orthopedic surgery in the institution.

CALIFORNIA

Personal.—Dr. L. L. Stanley has succeeded Dr. H. N. Kierulff as physician at the San Quentin State Prison and Dr. Francis Stolle, San Francisco, has been appointed assistant physician.——Dr. Charles T. Palmer, assistant health commissioner of Los Angeles, has resigned.

Hospital News.—Plans are being prepared for a new building to be erected for the French Hospital Association, College and Castellar streets, Los Angeles. The building is to be of reinforced concrete construction and will cost about $50,000. ——The supervisors of Marion County have authorized the construction of a county hospital building to cost $40,000 and to accommodate seventy-five patients. It will be of fireproof construction and will be located about four miles from San Rafael.——The contract has been signed for the construction of a hospital building for the Sisters of Mercy at Oxnard. The building will be 150 x 42 feet, of brick construction, two stories and a basement in height and will cost $42,000.——Plans are being prepared for a group of buildings to be erected on Marengo Avenue, Pasadena, for the Marengo Avenue Hospital. The main building will be a four-story reinforced concrete structure.

GEORGIA

Appropriation for Medical Department.—The legislature of Georgia has decided to give the medical department of the university, Augusta, an appropriation of $30,000 a year for the next two years, and the governor signed the bill providing for this, August 20.

ILLINOIS

Advisory Committee Appointed.—President McCormick of the Cook County Board of Commissioners has appointed a committee of experts to visit the tuberculosis institutions in Cook County and report as to conditions found and suggest means of improvement. The committee consists of Dr. Theodore B. Sachs, chairman; Drs. Stephen R. Pietrowicz and Ethan A. Gray and Mr. James Minnick.

Civil Service Examination.—The State Civil Service Commission announces that examinations will be held September 6 at various points in the state for general physician, class A, grade II, salary of $75 to $125 a month and maintenance, open to men and women between the ages of twenty-one to fifty. This examination is open to non-residents of Illinois; and for hydrotherapist at the Kankakee State Hospital, class B, grade II, salary of $60 to $75, open to persons over twenty-one years of age and local residence is waived. Application for above examinations and requests for information should be addressed to W. R. Robinson, chief examiner, State Civil Service Commission, Springfield.

Personal.—Dr. H. Lewis Pintler, Peoria, who has been critically ill in Chicago, is reported to be improving.——Dr. Emil Haass, Frankfort, celebrated his eighty-sixth birthday anniversary August 5.——Drs. J. Sheldon Clark, Freeport, and Carroll B. Welton, Peoria, sailed for Europe, August 9.——Dr. Joseph Cooperstein, Chicago, has been appointed assistant physician at the Chester State Hospital, vice Dr. William Hersio. ——Dr. T. McLain, assistant physician at the Peoria State Hospital, has been transferred to the Jacksonville State Hospital, vice Dr. Walter Treadway, resigned, to enter the U. S. P. H. Service.——Dr. E. W. Fell, Jacksonville, has been appointed assistant physician at the Elgin State Hospital, vice Dr. E. J. Kelloch, resigned.——Dr. J. S. Thrailkill, Bethalto, was seriously injured when his automobile went over a thirty-foot embankment in Alton, August 15. One leg was fractured and he sustained serious cuts and bruises.——Dr. Joseph M. Campbell, Marissa, has been appointed superintendent of the Watertown State Hospital.——Dr. J. L. Aleshire, Plainsville, was operated on for appendicitis recently and is reported to be doing well.——Dr. Russell V. Thomas has been appointed local surgeon for the Illinois Central Railroad at Manteno vice Dr. Zephrita Rouleau, deceased.——Dr. Andrew M. Harvey has moved his residence to La Grange, Ill.——Dr. and Mrs. Herman L. Kretschmer have sailed for Europe.

Chicago

Baby-Saving Campaign.—The Civic Federation of Chicago, in the hope of reducing the infant mortality rate in the city, has commenced a campaign of education by means of posters, urging mothers in the crowded wards of the city to "Keep Your Baby Well," and giving the addresses of the nearest Infant Welfare Society stations and the Elizabeth McCormick Baby Association at which free advice and care is given to all mothers.

INDIANA

Bequest to Hospital.—The Methodist Episcopal Hospital, Indianapolis, which at the present time is erecting its second annex, will benefit to the extent of two hundred acres of valuable land from the will of Simeon Smith, who recently died, near Bloomfield.

New Hospital.—The Elkhart General Hospital, erected at a cost of $80,000, was opened to the public, July 26-27, with a reception given by the board of directors and the officers of the Elkhart Training School for Nurses. During the two days five thousand residents of Elkhart and vicinity visited the school.

Hospital Improvements.—The Long State Hospital and the two units of the new Indianapolis city hospital will be ready for occupancy this fall. These buildings in connection with the annex of the Methodist Episcopal Hospital and the new St. Vincent Hospital will give Indianapolis ample hospital facilities for several years.

County Sanatoriums.—A hospital for the treatment of tuberculosis will be erected in South Bend, Indiana, at a maximum cost of $50,000. Thirty acres of land necessary to complete it have been condemned by the county commissioners and a board of four members, two of which must be physicians, will be appointed to supervise its erection.

Receiver Named for Sanatorium.—On application of the Pittman and Myers Company, manufacturing pharmacists of Indianapolis, Judge Brill has appointed a receiver for the Rockwood Tuberculosis Sanatorium, located six miles east of Danville; under bond of $25,000, with instructions to operate the institution until the property can be sold to an advantage.

IOWA

New Officers.—Fort Madison Clinical Society; president, Dr. J. R. Walker; secretary, Dr. J. G. Rea.

Personal.—Dr. S. C. Dunkle, Glidden, was operated on in Rochester, Minn., August 13, and is reported to be doing well. ——Dr. C. B. Burk, Atlantic, is said to be seriously ill with typhoid in Mercy Hospital, Council Bluffs.——Dr. Henry G. Langworthy, Dubuque, was operated on recently at Mercy Hospital for appendicitis.——Dr. O. W. Lowrey, Des Moines, was seriously injured by the overturning of an automobile near Oskaloosa, recently.——Dr. H. H. Nichols, Marshalltown, who underwent a serious operation at St. Thomas Hospital, recently, is reported to be convalescent.

KANSAS

Advisory Committee for State Board Named.—B. L. Thompson, a butcher, of Harrington, James Campbell, a candy maker of Salina, and W. F. Jackson, Fort Scott, of the Bourbon County retailers, have been appointed advisory members of the State Board of Health to represent the merchants of the State and to aid the board especially as regards pure food matters.

KENTUCKY

Bacteriologic Exhibit for County Fair.—The assistant state bacteriologist is preparing a bacteriologic traveling case of exhibits of local conditions for the county fairs of the state. The exhibit is for educational purposes only and is accompanied by similar cases prepared by the Experimental Station.

MARYLAND

Baltimore

Personal.—Drs. J. L. Hooper and Robert Hoffmann have sailed for Europe.——Dr. A. L. Fehsenfeld has been appointed medical examiner of schools, vice Dr. I. F. Page.

Purification of Drinking Water.—The health authorities are using three thousand pounds of hypochlorite of lime daily, with a view of purifying the drinking water of the city and limiting the prevalence of typhoid fever. A report shows that 99 per cent. of the bacteria in the water last year were killed by the use of hypochlorite of lime.

NEW YORK

Large Contributions to Tuberculosis Fight.—It has been announced by the State Charities Aid Association that gifts to aid the campaign against tuberculosis totaled $630,500, the largest contribution having been made by the late Mrs. Elizabeth M. Newton of Fredonia, N. Y., who bequeathed $150,000 for the purpose of founding a hospital for consumptives in Chautauqua County.

Violent Deaths in June.—There were 473 violent deaths in the state during June. Of these, 146 were from drowning, 145 died in railroad accidents, 116 were suicides, 44 were murdered, 12 died by electric shock, 7 from sunstroke and 3 were killed by lightning. June had 10,865 deaths, an average of 362 daily; of the uncommon or infrequent causes of death, 9 were tetanus and 6 from poliomyelitis.

Cottage Settlement for Consumptives.—Mrs. Thomas F. Ryan has purchased a 100-acre farm near Sloatsburg, Rockland County, where she proposes to establish a colony for the consumptives of that county. The site was recommended by Dr. Herman Biggs, and the buildings will be begun at once. The first object of the home is to provide for the consumptives of Rockland County but it is understood that if those from elsewhere knock for admission they will not be refused.

The State Health Department and Sex Hygiene.—In connection with the new work of the State Health Department in teaching sex hygiene circulars have been prepared and are being circulated entitled "Sexual Hygiene for Young Women," "Sexual Hygiene for Young Men" and "Suggestions to Persons Having Venereal Diseases." The work is carried on principally by lectures and exhibits. It is proposed to reach girls working in industrial establishments. In view of the increasing prevalence of cancer in this state and the fact that cancer so often attacks one or more of the sexual organs of the female, it is proposed to include in the educational campaign some lectures dwelling on the early diagnosis, means of prevention and necessity for early skilled treatment of cancer. In this phase of the subject the State Health Department will have the cooperation of the New York State Cancer Laboratory.

New York City

Personal.—Dr. and Mrs. Henry W. Mooney and Dr. and Mrs. C. E. Scofield, Brooklyn, have sailed for Europe.——Dr. Henry Mann Silver is rapidly convalescing from an operation for the removal of gall-stones, recently performed in Roosevelt Hospital.

Lower Death-Rate Among Babies.—For the week ended August 16 there were only 170 deaths of infants under one year, as compared with 194 for the corresponding week of 1912. The city has now passed the middle of August with a record of 309 fewer deaths than had occurred up to the same time last year.

To and From Europe.—*Among those who have returned from* Europe recently are Dr. and Mrs. Hermann M. Biggs, Dr. and Mrs. George E. Brewer, Dr. and Mrs. Howard C. Taylor, Dr. Richard H. Gibbons, Dr. Charles Ogilvy, Dr. Philip Van Ingen, Dr. and Mrs. Philip Embury, Dr. and Mrs. Fred H. Albee and Dr. H. G. Anderson. Among those who have sailed for Europe recently are Dr. and Mrs. S. Wells Churchill, Dr. H. Bayard Clark and Dr. William M. Ford.

Court Upholds Vaccination Law.—In the case of Hagbard Ekerold who refused to keep his child in school unless the board of education assured him that the child would not be subjected to vaccination, Judge Rosalsky of the general sessions court upheld a fine of $5 which had been imposed on the defendant by a police court and suggested that the case be carried to the higher courts in order to make a test case as to whether the action of the board of education on the subject of vaccination was in accord with the law.

Infant Deaths Increase in Three Boroughs.—Thus far for the year 1913 there have been 268 fewer deaths among babies than during the same period of 1912. During the week ending July 26 there were 53 fewer deaths among infants than during the corresponding week of 1912, though there was a considerable increase in the death rate in three boroughs, Richmond, Brooklyn and Manhattan. Thus far this year there have been 131 deaths from diarrheal diseases as against 164 for last year.

Court Decides Against Smoke Ordinance.—In the case of the Board of Health against the New York Edison Company the court has decided that the Health Department has enforced the ordinance against the smoke nuisance "unreasonably and unconstitutionally." There is a widespread sentiment that this decision is unwise and that if the smoke nuisance cannot be regulated by ordinance it will have to be controlled by legislation. It is hoped that an appeal in the case in question will result in a reversal of the decision.

Rules Sent to Milk Dealers.—The Health Department has sent to all stores where dipped milk is sold a set of rules which require that milk shall not be sold or stored in rooms used for cooking or other domestic purposes, or in any room where there is a lavatory. Milk must be kept at a temperature of 50 degrees or lower at all times. Such rooms must be clean, well lighted and screened. Dry dusting or sweeping in a room where milk is sold is prohibited. Only such persons shall be employed as are free from diseases which may be transmitted.

New Health Regulations.—There will be two important changes in the old system of dealing with cases of diphtheria, scarlet fever and measles. Insusceptible persons will *not* be excluded from school while a case of infectious disease exists at home, provided isolation is properly carried out. Quarantine in cases of measles will be terminated five days after the appearance of the rash, if such a course is warranted by the clinical condition. Periodic visitations will be made by nurses, and, if the regulations are disobeyed, the patients may be removed to a hospital.

Summer Hospital Will Keep Open All Year.—At a meeting of the board of trustees of St. John's Guild recently, it was decided to keep the Sea Side Hospital at New Dorp, S. I., open during the entire year instead of during the summer months only. The new buildings and equipment have made it possible to care for convalescent mothers who have been discharged from city hospitals and also to continue the treatment of orthopedic cases through the winter. Thus far this season 1.624 patients have been admitted to the hospital with an average stay per patient of 9.7 days.

Bequests.—The will of Mrs. Julia Lorillard Butterfield, the widow of General Daniel Butterfield, leaves about $350.000 to charitable and educational purposes of which the Association for the Relief of Respectable Aged Indigent Females receives $20,000 and the Association for the Aid of Crippled Children, $10,000. A bequest of $40.000 is made for the erection of a hospital in Cold Springs, N. Y., $40,000 is left for its equipment and $100.000 for its maintenance.——The will of Henry Korn gives $500 each to the Lebanon Hospital. Mount Sinai Hospital. Beth Israel Hospital and Montefiore Home.

To Help Expectant Mothers.—Through the generosity of Mrs. Robert H. Sayre five lots on the shore of Oak Beach. L. I., have been leased where cottages will be erected which will furnish single rooms to 100 expectant mothers. The funds for the buildings have been donated by a woman who has requested that her name be withheld from the public at present. It is proposed to take the expectant mothers for a month and to give them good food. rest and instruction in how to care for their babies. The work done in this direction by the milk stations has reduced the infant death rate to such an extent that it is believed that such an institution will be a great factor in lowering infant mortality.

New Children's Court.—The cornerstone of a new court house for children was laid on August 9 when it was explained that in this building the suggestion of a court of law would be eliminated as far as possible. Only those directly interested in the cases will be permitted in the room. Boy and girl delinquents will be brought to the room through a separate entrance and care will be taken to segregate them. The court is to be regarded as an experiment station where delinquent children will fall into the hands of those who understand them. On the cornerstone is inscribed "For every child let truth spring from earth and justice and mercy look down from Heaven." Proper provision will be made for the examination and diagnosis of the cases, and after diagnosis, for proper treatment through probation, thorough investigation of home conditions, and when necessary for commitment.

NORTH CAROLINA

Resigned to Help Hospital.—In order to disabuse the public of the idea that the Mission Hospital. Asheville, is a close corporation rather than a public institution, the members of the staff and adjunct staff have resigned. The campaign to raise $100,000 for a new building for the hospital will now be carried on actively.

Personal.—Dr. J. V. McGougan, Fayetteville, entertained the members of the Hoke-Cumberland County Medical Society, their families and invited guests, in number more than one hundred, with an old fashioned barbecue at his country home "Skiboo Place," August 11.——Dr. C. B. Woodley, Kinston, has been successful in his case in the Superior Court which involved the right of the telephone company to discontinue telephone service of a physician without his consent.

PENNSYLVANIA

Insane Hospitals Must File Reports.—The attorney general's department has handed down an opinion that no payments of appropriations can be made to the state insane hospitals unless they file quarterly reports.

To Build Hospital Group.—A group of six buildings of one, two and three stories in height, to cover an area of 150 by 558 feet, in Westmoreland County, will be built for the Westmoreland Hospital for the Insane.

Typhoid Traced to Milk.—The State Department of Health has completed investigations at Chester and confirmed the opinion of the local health authorities that the outbreak of typhoid fever was due to infected milk.

Hospital News.—The erection of the proposed St. Mary's Hospital, South Scranton, has been postponed on account of the bids submitted being in excess of the sum planned and secured for the work.——Chester Hospital has secured a new motor ambulance, the $4,000 for the purchase of which was secured by public subscription.

Personal.—Dr. J. C. Price, Scranton, has been appointed chief medical inspector of the newly instituted department of labor and industry.——Drs. E. E. Lamb, H. E. Helling and C. M. Iseman have been appointed directors of the Ellwood City Hospital Association.——Dr. John T. Eckert, Allentown, was seriously injured by the overturning of his automobile, August 5.

Hospital Notes.—The contract has been awarded for a two-story addition to the Hospital of the Good Shepherd, Rosemont.——A free dispensary has been opened in connection with the Crozer Hospital, Chester.——The Coatesville Hospital has arranged a department for sick babies which will be opened by the first of October.——Reading has opened its isolation hospital for small-pox at Avon, July 21.

Philadelphia

Personal.—Dr. W. H. Blakesley has been appointed medical inspector in the State Department of Labor and Industry.——Dr. Milton B. Hartzell has succeeded Dr. J. F. Schamberg, resigned, as assistant diagnostician and consultant to the Municipal Board of Health.

Increase Medical Course.—The Jefferson and Medico-Chirurgical Colleges announced on August 19, that no person will hereafter be admitted to the regular medical courses who has not spent a year in obtaining a premedical education, to consist chiefly of collegiate biology, chemistry, physics and German.

City Eye Dispensary Established.—A branch of the eye dispensary which has been maintained in the City Hall by the Department of Health and Charities for several years, will be established at the Southwark School and will be in operation at the end of the summer vacation. Dr. William J. Ryan will be in charge of the dispensary.

Impure Food in Storage Plants.—The State Dairy and Food Commission, making an investigation of all cold-storage establishments preparatory to the enforcement of the Gans bill which went into effect August 14, found decomposed meat and other food products in great quantities. In one of the refrigerating plants approximately 1,000 pounds of decomposed meat was ordered destroyed.

Charitable Bequests.—The will of the late Mrs. Anna F. Francine makes provisional bequests of one-third of her estate which is valued at $130,000 to the University of Pennsylvania Hospital, and the other two-thirds to the trustees of the Pennsylvania Epileptic Hospital and Colony Farm in Chester County.——The will of the late Henry Freedman gives $500 to the Jewish Hospital.

Notice to Milk Dealers for Next Summer.—The rule that all milk and cream sold in this city must be pasteurized by a process approved by the Board of Health, in addition to meeting the requirements imposed on the milk traffic, goes into effect July 1, next. The reason for the delay in enforcing the rule is that a drastic change will be made in the handling of the milk under the new regulation and dealers must install equipment to carry out this rule.

To Prevent Typhoid.—On August 22, Chief Vogelson, of the Bureau of Health, sent a circular letter to factory owners, urging their cooperation in effectually and promptly stopping pollution of filtered water through raw water pipe connections on their premises, for fire protection or manufacturing purposes, as much of the increase in typhoid fever is believed to be the result of contamination of city water mains by such private raw water piping systems.

Legality of Vivisection to Be Settled.—In the fall, an effort will be made to settle finally the legality of vivisection, when six physicians of the University of Pennsylvania will be arraigned before the grand jury. The Women's Pennsylvania Society for the Prevention of Cruelty to Animals is supporting the prosecution. The accused physicians ars Drs. Allen J. Smith, Edward T. Reichert, Alonzo E. Taylor, Joshua E. Sweet, Richard M. Pierce and Alfred M. Richards.

Summer Outings to Red Bank.—The two boats, The John F. Smith and the Elizabeth M. Smith, named after the donors of the free hospital and playground at Red Bank, N. J., make nine trips daily between that place and Philadelphia and carry about 600 women and children. These boats rechristened by the children, "The Johnny Boat" and "The Lizzie Boat," are rounding out thirty-six years of service and in that time have carried 3,456,134 persons from the tenements to Red Bank. There are all sorts of amusements for the children in the playground and luncheon is served about 11. Last summer 23,920 quarts of soup, 6,036 cups of tea, 3,566 quarts of milk and 98 barrels of crackers were dispensed. For babies too small to go into the bathing pools, there is a separate bathing house with twenty-two baby tubs and there are also tubs for the mothers. The hospital building is three stories high and accommodates eighty mothers and babies.

Infant Mortality Increasing.—Despite the numerous public and private baby saving enterprises in operation during the summer, figures compiled by the Department of Health show a decided increase in infant mortality for the first six months of this year as compared with the same period in 1912. The following table shows the increase over last year:

Age at Death	1912	1913
Under 1 year	1,904	2,203
1 to 2 years	430	518
2 to 5 years	451	523
5 to 10 years	259	305
	3,044	3,549

The general increase in the rate of mortality under 10 years of age is ascribed by Dr. Neff to the epidemic of measles that was prevalent in the city during the winter. The department is maintaining or helping to maintain six agencies throughout the city whose sole purpose is saving the baby. These include the Baby Hospital on the Race street pier, the instruction camp on the Chestnut street pier, Children's Hospital at Blockley, the maintenance of eight municipal nurses for private visiting, the permanent baby show at City Hall and interest in the Babies' Hospital at Wynnefield.

Care of Milk Supply of City.—Director Neff of the Bureau of Health and Charities has issued a bulletin warning milk consumers to protect themselves against inferior and unclean milk. Some of the directions contained in the bulletin follow:

> Cleanliness and cold are necessary to keep milk wholesome at home, as well as at the dealer's. Keep milk in the milk bottle, or container, covered, until wanted, and then pour out only as much as will be used at the time. Wipe the mouth of the bottle with a clean towel before removing the cap. Rinse the cap in running water before replacing it. If the cap is broken, place an inverted tumbler over the mouth of the bottle.
>
> All dishes, containers and utensils used for milk should be kept perfectly clean, first by being rinsed as soon as emptied, or directly after being used, with cold water, and then being boiled in clean water and set away, unwiped, bottom up, to dry. They are kept in much better condition this way than when cleaned in dish water and wiped with the ordinary dish towel. Do not use milk jars for any other purpose than holding milk.
>
> Keep milk in a separate compartment of the refrigerator. Milk absorbs unpleasant odors, as well as germs. Refrigerators should be kept clean and sweet; the outlet for melted ice should be properly trapped and the trap kept clean. Scald the food compartment of the refrigerator every week with a washing soda solution.

The following table shows the work of the health department for the first six months of the current year in looking after the city's milk supply.

Number of milk inspections		47,131
Number of quarts inspected		1,937,454
Number of quarts condemned and destroyed:		
On the street	1,692	
On the platform	11,241	12,933
Number of samples tested:		
Bacteriologically		2,095
Microscopically		1,061
Chemically		66
Milk licenses revoked		5
Cows inspected		3,299
Cows condemned		12
Farms and stables inspected		267
Pasteurizing plants inspected		91

TENNESSEE

Malaria in Memphis.—The superintendent of the Memphis City Hospital reports that from Sept. 1, 1912, to June 30, 1913, 393 cases of malaria were received in that institution. Of these 146 were white males, 37 white females, 174 colored males and 33 colored females. Of the first class, 100 were reported cured, 41 improved and 4 unimproved with 1 death; of the second class, 26 were cured and 10 improved with 1 death; of colored males, 143 were cured, 29 were improved, 1 unimproved and 4 died, and of colored females, 24 were cured and 9 improved.

VIRGINIA

New Officers.—Piedmont Medical Society at Fredericksburg: president, Dr. Harry L. Baptist, Ivy Depot; secretary, Dr. F. G. Scott, Jr., Orange.——Old Dominion Medical and Surgical Society at Petersburg, August 12: president, Dr. Thomas J. Fawcett, Lynchburg; secretary, Dr. W. A. Crowder, Petersburg.

Personal.—Dr. F. P. Dickinson, Fredericksburg, was thrown from his buggy in a collision with another vehicle, recently, fracturing his clavicle.——Dr. H. A. Warren, Suffolk, was operated on recently at Lakeview Hospital.——Dr. A. G. Crockett, Wythesville, was seriously injured in a runaway accident at Fort Chiswell, recently.

City to Build Hospital.—A resolution was introduced recently in the board of aldermen of Richmond, directing the council committee on public buildings, properties and utilities to examine into the feasibility of erecting a new and modern city hospital on the State Home property. The present city hospital is said to be inadequate to the needs of the municipality.

GENERAL

Mississippi Valley Medical Association Meeting.—The thirty-ninth annual meeting of the Mississippi Valley Medical Association will be held in New Orleans, October 23-25, under the presidency of Dr. Albert E. Sterne, Indianapolis.

Electrotherapeutists to Meet.—The twenty-third annual meeting of the American Electrotherapeutic Association will be held at the Engineering Society's Building, 29 West Thirty-Ninth Street, New York City, September 2-4, under the presidency of Dr. F. Howard Humphris, London, England.

Ophthalmologic Congress.—The Oxford Ophthalmologic Congress was held at Keble College, Oxford, July 17-18. Addresses were delivered by Prof. Emil von Grosz, Dr. John O. McReynolds, Dallas, Tex., Dr. J. Igersheimer, Lieutenant Colonel R. H. Elliot, I. M. S., Dr. J. Mawas, Dr. Franz Deutschmann, Mr. N. C. Ridley, Dr. T. Harrison Butler and Dr. F. W. Eldridge-Green

Bequests and Donations.—The following bequests and donations have recently been announced:

Union Hospital, Terre Haute, Ind., $50,000 by the will of James McGregor.

Darrach Home for the Crippled, $5,000, State Charities Aid Association, New York, $1,000, donation by Charles H. Marshall, New York City.

Johns Hopkins Hospital, Baltimore, about $5,000 by the will of Albert A. McElroy of Washington township, Pa.

Railway Surgeons Meet.—The New York and New England Association of Railway Surgeons will hold its twenty-third annual meeting at the Hotel Astor in New York City, October 22. The address on "Surgery" will be delivered by Dr. Hugh H. Young, Baltimore. Dr. John W. Le Seur, Batavia, N. Y., is president and Dr. George Chaffee, 338 Forty-Seventh Street, Brooklyn, N. Y., the corresponding secretary of the association.

Lane Medical Lectures.—The fourteenth course of Lane Medical Lectures will be delivered in Lane Hall, San Francisco, on the evenings of September 3, 4, 5, 8 and 9 at 8 o'clock, by Prof. Sir Edward Schäfer, professor of physiology, University of Edinburgh. The several subjects are on "Internal Secretion in General," "The Thyro-Parathyroid Glands," "The Adrenal Glandular Apparatus," "The Pituitary Body," "The Influence of Internal on other Secretions," and "Methods of Resuscitation" (to be delivered at Stanford University, Cal.). The lectures will be illustrated by lantern slides.

Life Insurance Directors' Meeting.—The third annual meeting of the medical section of the American Life Convention was held in St. Paul, Minn., August 19, under the presidency of Dr. H. A. Baker, medical director of the Pittsburgh Life and Trust Company, Pittsburgh. The most important subjects discussed were the "Curve of Mortality" and the "Insurability of Women." The following officers were elected: chairman, Dr. James H. Stowell, Chicago, medical director United States Annuity and Life Insurance Company; vice-chairman, Dr. Whitfield Harral, Dallas, Tex., medical director Southwestern Life Insurance Company; secretary-treasurer, Dr. F. L. B. Jenney, medical director Federal Life Insurance Company, Chicago; board of managers, Drs. James H. Stowell, Chicago; Whitfield Harral, Dallas, Tex.; Ambrose Talbot, Kansas City; Frank W. Foxworthy, Indianapolis, and F. L. B. Jenney, Chicago. West Baden, Ind., was selected as the place for the mid-year meeting and Dallas, Tex., for the next annual meeting.

American Mine and Safety Association and American Mining Congress.—The annual meeting of the American Mine Safety Association will be held in Pittsburgh, September 22, 23 and 24, with headquarters at the Fort Pitt Hotel. The organization has been in existence less than a year. It was formed for the purpose of promoting safety for underground workers, miners and others. This is expected to be accomplished by recommending proper safeguards against accidents, approved appliances and methods of procedure in safety inspection, mine rescue work and first aid treatment, also by circulating information on these subjects and encouraging the miners and other underground workers to consider their own personal safety and that of their fellow workmen by the establishment of national first aid corps, such as St. John's Ambulance Corps of Great Britain. In 1911, 2,719 persons were killed in coal mines alone; 9,106 were seriously injured and 22,228 were slightly injured. Nearly an equal number were injured in metal mines and quarries. It will be seen that the organization of mine workers and operators and the promotion of everything that would conduce to the safety of men engaged in these underground occupations is important. In recent years much attention has been given to providing safety appliances for mines. The American Mining Congress, which meets in Philadelphia, October 20-24, for its sixteenth annual convention, will also have an exhibit of safety machinery and appliances for mines.

FOREIGN

Report of Philippine Government Employees.—Dr. Victor G. Heiser, Director of Health, furnishes the following abstract of statistics of the health of government employees in the islands: Total number employed, 10,010; Americans, 2,810; Filipinos, 7,200. Deaths from illness: among Americans, 5; among Filipinos, 23: from violence, Americans, 2; Filipinos, 1. Average years of service: Americans, 6.93; Filipinos, 5.47. Average age at death: Americans, 38.93; Filipinos, 32.01. Annual death-rate per thousand: Americans, 1.77; Filipinos, 3.19. Annual death-rate per thousand for all nationalities, 2.79. All deaths, including those from violence, average rate per thousand, 3.09.

CANADA

Public Health Congress.—The third annual congress of the Canadian Public Health Association will be held in Regina, Sask., September 18-20, under the presidency of Dr. John W. S. McCullough, Toronto, provincial health officer of Ontario. The congress will hold general sessions and also there will be section meetings dealing with medical officers of health, medical inspection of schools, military hygiene, veterinary hygiene and food inspection, sanitary inspectors, engineers and architects, laboratory and social workers. The general sessions are to be held in the Regina City Hall and the sectional meetings in the Regina College.

Queen's Medical Faculty.—The medical faculty of Queen's University, Kingston, Ont., has submitted an amendment to its constitution whereby, when approved by the board of trustees, all financial control and responsibility will pass from the faculty to the board of governors of the university. In the constitution of 1892, academic union was provided for, but the financial administration remained in the hands of the faculty. Twenty-one years ago when the staff of the Royal College of Physicians and Surgeons of Kingston became a faculty of the university, there were ten professors, one lecturer, one demonstrator and two arts professors who taught medical students. At the present time the staff consists of fourteen professors, four associate professors in two faculties, five assistant professors, six lecturers and eight clinical assistants and demonstrators, thirty-seven in all. During this period of twenty-one years, 750 have been graduated from Queens in medicine. That this school of medicine has progressed is seen from the equipment of twenty-one years ago. Then there were a few stoves, a number of tabls and a part of a skeleton in the dissecting room. There was not a microscope in commission. To-day there are more than a hundred. In the past session, the fifty-ninth, the registration amounted to 251, an increase of two over last year. The finances are in good condition, there being a cash balance over all indebtedness of $4,452.99.

LONDON LETTER

(From Our Regular Correspondent)

London, Aug. 2, 1913.

Sleeping-Sickness in Nyasaland

Surgeon General Sir David Bruce, head of the sleeping-sickness commission which was sent to Central Africa nearly two years ago to investigate the disease, has returned to England. The commission has made some important discoveries. It has found that the sleeping-sickness in Nyasaland is not the same as that of Uganda or the West Coast, although it belongs to the same category. It is more rapid and even more fatal. There has been no case of recovery. It is now established beyond doubt that the disease is carried by *Glossina morsitans*, a fly which is widely spread over the whole of Africa and is not merely confined to well-defined areas, like *Glossina palpalis*, which has hitherto been regarded as the carrier of the disease. Sir David Bruce's work has been carried on in a proclaimed district of Nyasaland on the eastern shore of the lake, extending 50 miles from north to south, and 25 miles from east to west. Animals were shot early in the morning, and specimens of the blood while perfectly fresh were carried back by motor-bicycle to the laboratory for examination. Half the wild animals shot in the area were found to be infected with sleeping-sickness in some form or other, and in all probability the whole of them may be said to be affected. The commissioners are of opinion that the game in these areas should be regarded in the same light as mad dogs and destroyed as a standing menace to natives and whites alike. Sir David Bruce's report has not yet been considered by the authorities, so it cannot yet be said what steps will be taken. The disease in Nyasaland and north and northeastern Rhodesia has been given the name of sleeping-sickness, but the work of the commission went to show that it was the old tsetse fly disease of the South African hunters, which was formerly supposed only to attack animals, but has now spread to man. Some regard the disease as a new one, but Sir David Bruce believes it to be the disease known over large areas as nagana and called by that name in the nineties. Human cases have been found not only in Nyasaland, but also in northeastern Rhodesia, Portuguese East Africa and South Zambesia, and in all probability other cases will be discovered wherever these flies are found, for it is proved that *Glossina morsitans* carries the disease known as nagana. Sir David Bruce does not believe that there is any danger of the disease spreading. He is of opinion that it has probably been in these areas from time immemorial and that it will never assume the terrible proportions of the sleeping-sickness of the Congo or Uganda. Camps were established [illegible]ses, but they were found to be of no [illegible] with the natives. As patients were often found when the disease had run two months of its course, and as they invariably died during the third month, the native naturally regarded the camps with suspicion, and accordingly sufferers were treated in the village.

The Control of Venereal Disease: Demand of the Profession for a Government Inquiry

In this country there is no system of examination and control of prostitutes, such as exists in other European countries. Consequently the state does nothing to prevent the spread of venereal diseases. The difference may be explained on two grounds. This country is more individualistic than others; the state interferes less in personal affairs. In the second place a strong objection exists among religious persons to "the state recognition of vice." In a letter addressed to the press a demand has been made by the leading men in the profession, including the presidents of the Royal Colleges of Physicians and Surgeons, Sir William Osler, Sir Clifford Allbutt and the principal dermatologists and syphilologists for some action on the part of the government. It is pointed out that the increase of medical knowledge during the last sixty years has been extremely rapid and the control of health problems by the state and municipalities has become one of the most striking features of modern civilization. The state has compelled local authorities to build asylums for the insane; it has encouraged them to make provision for the segregation of cases of infectious fevers; it has insisted on the notification of many infectious diseases; it has undertaken the inspection of schoolchildren on a colossal scale; it has introduced an elaborate machinery to insure the purity of foods; it is steadily building up a vast system of public health legislation. To-day we are looking forward to what may be the effects of the campaign against tuberculosis. In all this organized effort there is one notable omission. There has always been a conspiracy of silence with regard to venereal disease. When the subject was discussed last year at the Royal Society of Medicine it was stated that in London alone 40,000 new cases of syphilis occur every year. The disease claims its victims not only from the vicious but also from the innocent. We are living to-day in a new era as regards diagnosis and treatment. The microbes responsible for venereal diseases have been discovered. The time is threfore ripe for an organized effort on a comprehensive scale to reduce the incidence of these diseases. The experience of the army medical department has shown during the past few years that an enormous reduction can be brought about by systematic effort. Organized effort among the civilian population is impracticable until the public conscience has been aroused, and can be attempted only after a full and authoritative investigation. These leaders of the profession therefore appeal to the public to demand the appointment of a "royal commission" (a government commission), its members to include a substantial majority of physicians, to investigate and recommend what steps, prophylactic and therapeutic, should be taken to cope with these diseases. In reply to a question in parliament the prime minister said that the subject would receive the careful consideration of the government. It will be discussed at a meeting of the International Medical Congress by the leading syphilographers of this and other countries and is expected to excite so much interest that the section of dermatology, which meets at St. Thomas' Hospital, will be moved to meet for this purpose at the Albert Hall, the largest hall in London. Probably in anticipation of this the demand referred to before has been made.

PARIS LETTER

(*From Our Regular Correspondent*)

PARIS, Aug. 1, 1913.

The Campaign Against Tuberculosis

The Académie de médecine recently passed a resolution in favor of the obligatory reporting of tuberculosis, and it is beginning to be conceded that if such declaration is not to be a vain word, prophylactic measures are necessary. A bill has been presented before the senate for the foundation of public antituberculosis dispensaries for general antituberculosis education, the giving of advice with regard to prophylaxis and hygiene, for facilitating the admission of patients into suitable institutions and placing within the reach of the public disinfection service for clothing, dwellings and so on, rendered infectious by patients. Free consultations and distribution of medicine should also be provided for by the dispensaries. According to the senate bill the necessary funds will be looked for in part from private sources and in part from the government. When the number of deaths in the commune shall have exceeded the average mortality in France during three consecutive years, the foundation of an antituberculosis dispensary is to be obligatory. The commune, department and government are to bear the expense in equal proportion.

Aid for Large Families

A law has just been promulgated according to which every head of a French family, responsible for the expenses of more than three legitimate or recognized children, whose resources are insufficient to take care of them, is to receive an annual allowance for each child, after the third, who is less than 13 years of age. If the mother is responsible for the children on account of the death of the father or through his abandonment of the family, or for any other reason, the same assistance is to be rendered for each child after the first. If the mother is dead or has abandoned the family, the father is to receive assistance for each child after the second. Relatives who care for the children after the death or abandonment of father and mother are to be considered as heads of families.

Measures Against Flies

The Council of Public Hygiene and Health has had the prefect of police publish 500,000 copies of a circular to be distributed throughout France, giving advice in regard to the protection of food from flies, the excluding of flies from dwellings, the destruction of flies and the prevention of their reproduction. Posters, giving similar information, have been distributed and posted in Paris and in the provinces.

Necropsy Arranged by Will

Dr. Pinard, professor of clinical obstetrics in the University of Paris, and M. Barrier, inspector general of the veterinary schools, both of whom are members of the Société pour la propagation de l'incinération, have left instructions in their wills that their bodies shall be delivered to the Faculté de médecine for necropsy before being burned.

The Psychophysiologic Signs of Superior Skill among Typewriters

Recently M. J.-M. Lahy reported to the Académie des Sciences the results of his investigations of the psychophysiologic signs indicative of superior skill among typewriters. He classes his subjects according to the rapidity and exactness of their work, judged by the results of their copy of a text containing 1,702 characters. After this test, each subject was examined for memory of figures and phrases, attention, imagination, abstraction, judgment, reasoning, tactile and muscular sensibility, auditory reactions and dynamometric force. The conclusions are that abstraction, judgment and imagination seem to have no part in the superiority of typewriters. The constant characteristics in a general way among good typewriters are good memory for concrete phrases, a tendency to equal muscular strength of the two hands, well-developed tactile and muscular sensibility and sustained attention. Curiously, these experiments have shown in all the good subjects a relative slowness of auditory reactions, indicating that a relatively slow action, well coordinated, is preferable to one that is rapid but poorly coordinated.

BERLIN LETTER

(*From Our Regular Correspondent*)

BERLIN, Aug. 8, 1913.

Personal

Professor von Wassermann has been appointed director of the Kaiser Wilhelm Institute for Experimental Therapy.—— General staffsurgeon a.D. Dr. van Bestelmeyer died at Munich a few days ago.

Professor Rosenthal of Erlangen has resigned his position. Professor Weinland of Munich has been called as his successor.

Professor Hering of Prague has been called as director of the newly founded pathologic-physiologic institute, and Prof. R. Müller of Kiel, as director of the hygienic-bacteriologic institute erected at the Academy for Practical Medicine in Cologne.

Professor Dietrich, prosector at the public hospital in Charlottenburg, has been appointed director of the pathologic institute of the Akademie für praktische Medizin in Cologne.

Professor Schmieden, for many years assistant to Professor Bier, has been called to succeed von Bramann as director of the surgical clinic at Halle.

Minor Sanitary Measures Demanded by the Organized Profession

The business committee of the Berlin ärztliche Standesverein, the association representing the professional interests of Berlin physicians, at its last session adopted the following resolutions:

1. The management of the Berlin street car company is notified of the frequent violation of the street-car regulation prohibiting tearing off the street-car tickets from the block with the finger moistened with saliva, and is requested to secure the greatest possible abatement of this nuisance. The chief of police is also requested to secure the abatement of the similar nuisance in shops of moistening the finger with saliva in tearing off paper bags and wrapping paper.
2. The chief of police is also requested to take some action with reference to the nuisance so offensive to esthetic taste and to sanitary safety due to the pollution of the streets of Greater Berlin by dogs.
3. The business committee also petitions the authorities in charge of the municipal hospitals asking for an abatement of the evils connected with charges for treatment of ambulant patients in the hospitals.

The Work of the Berlin Medical School Inspectors

The number of Berlin public schoolchildren for the year 1911-1912 was about 225,000, the number of boys and girls being practically equal. About 34,000 children entering school for the first time were examined by the medical inspectors, an average of 680 for each school physician. Physical or mental unfitness for school was found in 9.72 per cent. as compared with 10.55 per cent. for the previous year. The causes were general debility (anemia) in 1,317; rickets in 377; scrofula in 140; bone tuberculosis in 77; pulmonary tuberculosis in 155; other lung diseases in 134; heart disease in 61; kidney disease in 5; nervous diseases in 133; epilepsy in 28; imperfect mental development (idiocy or feeblemindedness) in 75 and 440 respectively; disturbances of speech in 73; nose and throat affections in 7; eye diseases in 40; ear diseases in 26; skin diseases in 19; curvature of spine in 89; hernia in 8; deformities in 25; other diseases in 73. Thus, 47,619 children were placed under medical supervision, a percentage of 21.22 as compared with 21.4 in the previous year. For the schools for backward children and special classes for the feeble-minded, 1,133 children were examined. Of these, 925 children were assigned to the subsidiary schools, 103 were left in the common school, 14 were transferred to idiot asylums, 91 were placed under private instruction; 448 children were examined for the courses in stuttering and 174 children for the special classes for those hard of hearing.

THE DENTAL CLINICS

In the first Berlin school dental clinic the number of children treated was 11,950, in the second, 16,023. Here the attendance has increased about 3,000. In the newly opened third school dental clinic the subscription system was tried. The children subscribing are placed under dental treatment and supervision during the entire year. One mark per year is required for each child of well-to-do families; for all of the public school children of the same family, three marks. The city of Berlin has raised the appropriation for the school dental clinics from $3,750 (15,000 marks) to $6,250 (25,000 marks).

CONTAGIOUS DISEASES

On account of contagious diseases, 80 classes were closed during the year as compared with 40 in the previous year. In view of the occurrence of numerous very obstinate epidemics of diphtheria and scarlet fever, a circular has been prepared to be given to the children to take home when a case of contagious disease occurs among the scholars in the room in question.

Use of Meat

Professor Max Rubner, the well-known physiologist and hygienist of Berlin, has contributed a valuable article to the discussion of the meat question which has excited a good deal of agitated public discussion, not always according to the facts. He devotes a large amount of space to this question in his work just published entitled "Changes in the Food of the Masses" (Wandlungen in der Volksernährung). From the material which he brings forward he shows that there is no question of a lessening of the use of meat or of Germany falling behind other nations in this respect if we take into consideration a long period of time. At the present time the inhabitants of Australia are by far the largest meat eaters, consuming 111.6 kg. (250 pounds) per capita yearly. The consumption is only half as great in the United States (54.4 kg.). Then comes Germany (52.30), England (47.6), France (33.6), Belgium and Holland (34.3), Austria-Hungary (29), Spain (22.2), Russia (21.8) and Italy (10.4).

It is thoroughly false when the Englishman is pointed out as the beefsteak eater, for the German eats on the average somewhat more meat than the Englishman. Formerly his use of meat was markedly less and the following figures show how it has grown within a century. In 1816 Germany consumed per capita 13.6 kg.; in 1840, 21.6; in 1861, 23.2; in 1873, 29.5. Then occurred a temporary fall in 1883 to 29.3, followed by a rise in 1889 to 32.5; in 1900 to 43.3, and in 1907 to 46.2. At present the use of meat is 3.4 times as great as it was a century ago. In 1813 the consumption of meat in Germany was about the same as it is to-day in Italy, the country that uses the least meat of any in Europe. To be sure, there is at present about as great a difference between city and country, the cities consuming the most meat. The average consumption in the cities is 52.4 kg. per capita annually as compared with 31.6 kg. in the country. All the cities, although the consumption of meat varies very much among them, are above the average of the country districts. The least meat is used in Königsberg (40.7 kg.) while there is a large consumption in Berlin, Karlsruhe and Mannheim (70.9 kg.) and the largest in Munich, Augsburg and Nuremberg (80.2 kg.). A large consumption of meat was also characteristic of Munich in the past. The bulk of the meat is consumed by artisans, the so-called upper classes eating only one-seventh. Rubner divides the use of meat among the trades as follows: Farm and day laborers, 16.5 per cent.; artisans, 44.8; the lower middle class, 15; the middle class, 10.5, and the higher class, 12 per cent. The increase in meat consumption is to be attributed to the more frequent use by the lower classes.

Vital Statistics of Prussia 1911-1912

In the state of Prussia during 1911, there were reported 1.225,091 births, 732,728 deaths (including 35,874 still-births) and 321,151 marriages. The excess of births was 492,363 or 12.1 per thousand of the average population. In 1912, there were born according to the previous sources of information 1.219.867 children (including still-births) and there were 671.909 deaths. There were 328,415 marriages. According to this, the number of births was 5,224 less than the previous year and the number of deaths 60,819. The excess of births accordingly had increased by 55,595, an increase from 492,363 to 547,958. An especially striking feature of last *year's statistics is the decreasing* number of births with an increase in the number of marriages. While during the decade from 1902-1911 the number of births was on the average, 1,284,110, the number of deaths, 725,241, the excess of births, 558,869, the number of births in 1911 was already 59,019 below the average of the decade, and in 1912, 64,243. The number of deaths in 1911 was 7,487 above the average of the decade but in 1912 remained 53,332 below the average of the decade. The number of marriages in 1911 was 17,631 above the average It of the decade from 1902 to 1911 and in 1912 it was 24,895. is consequently evident that the fertility of married women has suffered a not inconsiderable reduction. While the birth-rate has sunk about 18 per cent., the death-rate until 1911 had diminished about 11 per cent. and was in the last year about 22 *per cent.* lower than in 1903. The marriage-rate for 1912 agrees with the average for the decade, 16

SEVENTEENTH INTERNATIONAL MEDICAL CONGRESS

August 6-12, 1913

(From Our Regular and Special London Correspondents)

(Continued from page 613)

The Garden Party at Windsor

The great event of the Congress in the way of entertainment was the Garden Party given by His Majesty the King at Windsor, on Saturday, August 9. The invitations were limited to 2,000. Four special trains from Paddington station carried the guests to the main entrance to the Castle where the Lord Chamberlain, the Comptroller of the Household and other officials received them on behalf of the King. The visitors then passed rapidly into the Great Quadrangle and proceeded to follow a steward through the whole of the State Apartments used by His Majesty when entertaining sovereigns on visits of state. Entering the vestibule the guests were conducted up the grand staircase into the state anteroom, decorated with exquisite carvings of fish, fruit and game, by Gibbons. Passing thence through the picture gallery containing masterpieces by Rembrandt, Holbein, Claude, Andrea del Sarto and many other masters, the Van Dyck Room (formerly the Queen's ball room) was reached, decorated entirely by works of Van Dyck. The Queen's audience chamber, decorated with fine Gobelin tapestries executed for Louis XIV from designs by Jean Francis de Troy, representing the history of Esther, was then traversed into the Queen's presence chamber. Thence through the grand room the visitors entered the magnificent St. George's Hall, decorated with the shields and banners of all the knights of the order from its foundation. The grand reception room, where guests are received for banquets in St. George's Hall, came next. It is decorated with Gobelin tapestries representing the story of Jason and Medea. On the left the throne room, hung in blue velvet, was entered. It contains a silver gilt throne ornamented with cut crystals, formerly the state chair of the King of Candy. Passing through the ante-throne room, the Waterloo chamber, the grand vestibule and down the grand staircase again, the visitors were ushered through the Italian Gardens, where the band of the Coldstream Guards was playing, on to the east lawn, a magnificent pleasance where tea was prepared in large marquees. The tables were decorated with roses and carnations from the royal gardens, and besides tea and coffee, champagne and other beverages were abundantly forthcoming and the most dainty delicacies and confections were served. The guests scattered about through the pleasance or gathered in groups greeting old friends and making new ones until 6 o'clock, when, after viewing the Albert Memorial Chapel and St. George's Chapel they returned to town in special trains, arriving soon after 7 o'clock after a unique day of beautiful weather.

The same evening (Saturday) Sir Lauder and Lady Hamilton entertained a large party of the more eminent foreign visitors to dinner at the British Empire Club.

Dr. Norman Moore, president of the historical section, also entertained about thirty of the section at a dinner. The dinner of the Section of Obstetrics and Gynecology also was held on Saturday evening, August 9.

Church Services Sunday

On Sunday morning, August 10, a large number of members of the Congress attended the special services at St. Paul's Cathedral (Anglican), where the sermon was preached by the Dean, the Rev. Dr. Inge, at Westminster Abbey (Anglican), where Bishop Ryle preached, or at Westminster Cathedral (Roman Catholic) where Cardinal Bourne preached. The theme in all cases had reference to the intimate connection between the functions of the priest and the physician. Dean Inge, however, struck a very modern note when he impressed on his hearers the importance of throwing the weight of their influence into matters of state. Bishop Ryle adverted favorably to the movement in favor of facing the subject of venereal diseases. The service at the abbey was marred by unseemly interruptions from suffragettes.

Other Sunday Happenings

An excursion to Harrogate, one of our British spas, and an invitation by the Council and Medical Fellows of the Zoological Society to some 2,000 members to visit the garden, where numerous informal lunch and tea parties took place, provided for some of the visitors. About 500 were entertained by Mr. and Mrs. Waldorf Astor at their seat at Cliveden, one of the most beautiful spots on the Thames, where tea was served on the terrace to the music of the band of the Coldstream Guards. The Physiologic Section gave a river picnic on the Thames and Sir Watson and Lady Cheyne entertained about 200 of the Surgical Section at a river party starting from Taplow. Another delightful trip was that of the Electrotherapeutic Section of the Royal Society of Medicine, who took about 160 up the Thames from Westminster Bridge to Sunbury, providing luncheon and afternoon tea. The Anesthetic Section also had a luncheon at the Zoological Gardens. The Sections of Rhinology and Laryngology and of Otology took 300 ladies and gentlemen of the Congress to Oxford.

Honoring Lord Lister and Sir Patrick Manson

Monday's Events

A graceful tribute was paid on Monday, August 11, when the French members of the Congress accompanied Dr. Lucas-Championnière to the Royal College of Surgeons and placed a laurel wreath entwined with roses on a new bust of Lord Lister specially executed for the college by Sir Thomas Brock, R. A. Another foreign tribute to British scientific work was the presentation in the Section of Tropical Medicine and Hygiene on Monday to Sir Patrick Manson of a medallion in gold, bearing his profile, the work of M. Richer, of Paris.

Entertainments on Monday showed no sign of slackening. An excursion to Stratford-on-Avon, a visit to the Middlesex Hospital, garden parties at the London, Guy's and University College Hospitals and at the Hill, Hampstead Heath, found occupation for 2,500 members and their ladies. In the afternoon the nine medical Masonic lodges of London welcomed their foreign Masonic brethren at a special lodge held under the banner of the Aesculapius Lodge, No. 2410, at Freemason's Hall, when about 150 members of English medical lodges and officials of the Grand Lodge of England and 100 visitors from all parts of the world attended. The Pro-Grand Master of England, Lord Ampbhill, presided, and addressed the lodge, reading a letter from the Grand Master, the Duke of Connaught, regretting his inability to be present. The representatives of the various nationalities replied, Bro. C. M. Green, P. D. G. M., of the Grand Lodge of Massachusetts, speaking on behalf of the Masons of the United States.

In the evening the President of the Congress, Sir Thomas Barlow, gave a dinner at the Savoy Hotel at which 200 distinguished British and foreign members were present, as well as the Lord Chancellor, the Archbishop of Canterbury, the Archbishop (R. C.) of Westminster, the American Ambassador and Lord Strathcona. Later Lord and Lady Strathcona's garden party was attended by upward of 5,000 visitors in the beautiful grounds of the Royal Botanical Society, Regent's Park. The scene was enchanting.

Other entertainments on Monday evening were the dinner of the Royal Army Medical College to naval and military surgeons from abroad, and a conversazione and reception of members of the Dermatological Section in the Princes' Restaurant, Piccadilly.

On Tuesday, August 12, there were half-day excursions to Cambridge, Oxford, Canterbury and Farnham.

Sir Frederick and Lady Eve gave a garden party at Kew and the President of the Stomatological Section, Mr. Morton Swale, one at Henley. The members of the Section on Diseases of Children paid a visit to Queen Mary's Hospital for Children, Carshalton. In the evening the Sections of Rhinology and Laryngology and of Otology gave a combined dinner at the Hotel Cecil to which ladies were invited.

International Association of Orthopedic Surgery

An International Association of Orthopedic Surgery was decided on during the Congress and a committee has been found to attend to its organization. The committee consists of the following representatives, all of whom have attended the Congress: United States, Prof. R. W. Lovett of Boston; Great Britain, Mr. Robert Jones of Liverpool; Holland, Professor Murk Jansen of Leyden; Italy, Professor Putti of Bologna; France, Professor Kirmisson of Paris; Germany, Professor Vulpius of Heidelberg; Hungary, Professor Dollinger of Budapest; Canada, Professor Clarence Starr of Toronto; Russia, Professor Turner of St. Petersburg; Austria, Professor Spitzy of Vienna, secretary.

Esperanto Medical Association

The Universal Esperanto Medical Association (Tutmonda Esperanta Kuracista Asocio) held two meetings in the Geological Laboratory of the Royal School of Mines, under the presidency of Dr. Jameson Johnston of Dublin. At the first meeting on August 8 Dr. Johnston delivered an address on the "Need for a Common Language for Mutual Understanding in Congresses and the Use of Esperanto in Medicine." Addresses were also delivered in English, French, German, Russian, and other languages on Esperanto and the medical profession, and a number of recruits were made. The second meeting, on August 11, was taken up with the discussion in Esperanto of highly technical subjects.

Report of Permanent Commission and Award of Prizes

At the closing meeting, held in the Albert Hall on August 12, the Permanent Commission of the Congress presented its report. Besides resolutions urging governmental intervention in regard to syphilis by all the nations officially represented at the congress, protesting against any interference with animal experimentation, urging the disuse of overmilled rice and the abolition of quarantine in regard to beriberi, and changing the name of Malta fever to that of undulant fever, the report recommended the acceptance of Munich as the place of the next Congress, to be held in 1917, and nominated Prof. Dr. Friedrich von Mueller as president-elect. It also announced the award of the Congress prizes, as follows: The Moscow prize to Prof. Charles Richet of Paris, for his work on anaphylaxis. The Paris prize to Prof. A. von Wassermann of Berlin, for his work on experimental therapy and immunity. The Hungary prize to Sir Almroth Wright of London, for his work on anaphylaxis.

Hon. John Burn's Address

On the closing day at the Albert Hall Hon. John Burns, president of the Local Government Board, delivered an admirable address on the "Relationship between Medicine and Public Health."

Address on Heredity

On Monday, August 11, Professor Bateson, F.R.S., of Cambridge University, delivered an address on Heredity in Jehangir Hall of the University of London. After a tribute to the penetrating foresight of Francis Galton, Professor Bateson said that by accurate genetic analysis the means was afforded not merely of elucidating the inter-relation of parent and offspring, but also of contributing to a right interpretation of various special problems of pathology and anthropology, a true understanding of the course of human history, and the direction and control of the progress of mankind. The essence of the Mendelian principle was (1) that in a great degree the properties of organisms were due to the presence of distinct detachable elements separately transmitted in heredity; and (2) that the parent could not transmit to the offspring any element or its corresponding property which it did not itself possess. After reviewing the fundamental facts of the Mendelian doctrine, and showing that the presence or absence of a given property might be due to either a positive or a negative character, Professor Bateson pointed out that the American students of genetics had made it clear by evidence that feeblemindness had at least one mark of a recessive condition. But while the mental deficiency bill was a movement in the right direction, the violent measures now being adopted in some of the United States (e. g. Pennsylvania and New Jersey) gave ground for some disquietude. It was one thing to check the reproduction of hopeless defectives; it was another to recognize a wholesale tampering with the structure of a population such as would follow if any marriage not regarded by officials as eugenic were liable to prohibition. Nothing yet ascertained by genetic science justified such a course, and we might wonder how genius and the arts would fare in a community constructed according to the ideas of such legislators. There was a danger that in ridding the community of mania we should leave it gravely affected with dulness. The genetic analysis of insanity was at present practically impossible because the diagnosis of its various forms was by no means clear, and the conditions of life had obviously much to do with the development of such weaknesses. The tendency of the work of genetics was more and more to exhibit the fixity and definiteness of the laws of descent. Evolutionary change was effected not so much by gradual transformations under ameliorating or detrimental conditions, but mainly by the occurrence of individual or sporadic variation. The direction in which genetic research points was not difficult to determine. Those who had some knowledge of genetic physiology were aware that the whole form of modern science and legislation had hitherto been exercised in the preservation of defective strains, and would not feel serious hesitation as to the true cause of the increase of lunacy pointed out by Sir James Crichton Browne as running in certain decades.

Discussion on Internal Secretions

(Continuation from last week of report of Medical Section)

Friday morning, August 8, was held a joint session of the Section of Medicine with the Section on Physiology to discuss "The Correlation of the Organs of Internal Secretion and Their Disturbances." Prof. Sir E. A. Schäfer was in the chair. The discussion was opened by Prof. E. Gley of Paris, who gave a résumé of the methods by which the existence of internal secretions could be determined. He pointed out a fact that is overlooked by too many of the workers in this field of physiology, that one cannot take it as proved that the substances found in the extracts made from organs were present in these organs during life. These extracts were often highly toxic, but it must not be assumed that the toxicity was due to specific substances secreted by the organ; the toxicity depended on many conditions, and most of all on the method by which the extract had been prepared. Among other topics, he dwelt on the phenomenon of tachyphylaxis, exhibited when an animal's tissues acquire the property of resisting a second toxic injection within a few minutes or hours, while the first injection had found these tissues unprepared and open to attack. The reciprocal actions of the various ductless glands were of course, he admitted, extremely complex and hard to disentangle; he looked for solution of these problems to laborious physiologic and clinical work in the future. Several succeeding speakers—Professor Biedl of Vienna, Professor von Korányi of Budapest, Prof. F. Kraus of Berlin—read papers dealing with generalities and matters of detail that lend themselves little to condensation in such an account of the proceedings as this. Professor Cushing of Harvard gave an admirably clear and well-illustrated account of much of his own experimental and clinical work on disorders of the pituitary body. He exhibited slides of dogs whose pituitary bodies had been removed, and followed them with slides of human beings presenting very analogous—*mutatis mutandis*—syndromes. The adiposity and infantilism characteristic of Frölich's syndrome might, to some extent at any rate, be inherited; a photograph was exhibited showing a grandmother and a mother who both presented several of the outward features of the syndrome, while the daughter, just the sort of child one would have expected of such an ancestry, exhibited the syndrome in all its completeness. Professor Cushing brought to the attention of his audience a new type of dyspituitarism; the patients of this type are thin instead of being fat, but exhibit the same loss of secondary sexual characteristics (though perhaps by retrogressive change) as the patients of the commoner adipose type. He referred to several other types of dyspituitarism, and showed how in some the disease had been diagnosed as myxedema, and had received the appropriate treatment without benefit. He had found that the exhibition of pituitary extract improved these patients, and he took such a therapeutic success to be evidence of the correctness of his diagnosis. Another patient, a girl of 6, looked as if she were 16 years old; she had menstruated from the age of 2, and the secondary sexual characteristics had made their appearance when she was 3. He pointed out in conclusion that further researches into the functions of the pituitary gland would very likely throw light on the physiology of sleep; they had already done something to illuminate the etiology of hibernation. Other points in the correlations of the ductless glands were brought out by other speakers, including Professor Herring of St. Andrews, Dr. Falta, Dr. Blair Bell of Liverpool, Prof. Swale Vincent, Prof. G. Murray of Manchester, Professor Morsaline of Buenos Aires, and others. Professor Gley, in replying to a number of the points raised, took occasion to emphasize that hyperplasia of a gland, of the suprarenals in granular kidney, for example, was not necessarily equivalent to its functional hyperactivity, an assumption often made. The hall in which the meeting took place was crowded to its utmost capacity, and the discussion reached and maintained an unusually high level of excellence.

The afternoon session (August 8) was devoted to the reading of three papers. The last of these, by Dr. Haven Emerson of New York, dealt with the occurrence of the status lymphaticus in adults. The general public comes to hear of this uncommon condition from time to time through the coroner's court; for the children or adolescents who suffer from status lymphaticus or lymphatism are those who are apt to die suddenly while under the influence of an anesthetic. Dr. Emerson brought forward a number of considerations to show that a milder degree of lymphatism is surprisingly frequent in the adolescents and adults treated for chronic alcoholism and mental disease. His facts and figures are drawn from 1,000 of the male patients admitted to the alcoholic wards of the Bellevue Hospital, New York: No less than 220 of these patients showed most if not all of the physical attributes characteristic of the status lymphaticus. The chief of these attributes are as follows: Scantiness or absence of the hair on the lip, chin, chest, axilla; a feminine type of distribution of the pubic hair; a tendency to narrowness and length in the thorax; a notable roundness and arching of the thighs and roundness of the upper arm; smallness of the penis and testes. Often the skin is peculiarly soft and velvety, and curiously free from hairs. Dr. Emerson failed to find the enlargement of the spleen that is so commonly said to occur in lymphatism. Examining the post-mortem records he found 288 cases of lymphatism in 3,600 autopsies, and 242 of these patients had succumbed to infectious diseases such as tuberculosis, pneumonia, meningitis, enteric fever. He draws the conclusion that persons with this mild type of lymphatism are bad subjects for surgical operations, are prone to die if they contract an infectious disease, and show a tendency to alcoholism and insanity. He does not go so far as to say that they are social undesirables, but thinks that they should be protected against infections and against themselves.

Discussion on Heart Troubles

A first-rate discussion on "The Pathology of Heart-Failure" during the morning session Saturday, August 9, was opened by Prof. H. Vaquez of Paris, who began with an account of the various methods of clinical investigation and the symptoms that tell one when heart-failure is to be expected or diagnosed. The chief of these were acceleration of the pulse-rate, fall in the arterial blood-pressure, changes in the cardiac rhythm (and particularly the appearance of certain forms of irregularity), and alterations in the form of tracings furnished by the electrocardiograph. Employers and interpreters of the electrocardiograph, however, should not permit zeal to outstrip discretion, and attempt to draw from the electrocardiogram deductions more precise than our present knowledge warrants. Examination with the x-ray, especially when repeated from day to day, gave more valuable information about heart-failure than any other method. Failure of the heart might be either partial or total, and might affect different chambers of the heart in different cases. Thus failure of the auricles was not rare in mitral disease, and often really seemed to make but little difference to the patient. Failure of one or other of the ventricles of the heart was commoner; failure of the left ventricle was the cause of those painful palpitations and attacks of painful dyspnea that frequently occurred toward the end in severe cases of heart-disease, and often brought with them sudden death. Primary failure of the right ventricle, contrariwise, was characterized by quite other features — painless shortness of breath on exertion, with only a slight increase in the rate of the pulse. Total cardiac failure involving all four chambers together was rare; it might occur in healthy persons after prolonged and violent muscular exertion — in Marathon runners, for example. But it might also occur, oddly enough, in the pot-house patrons of such athletes, or in those who drank vast quantities of beer (the Munich or Tübingen beer-heart, so-called). Professor Vaquez and Professor Wenckebach, who followed him, believed that our prognosis in cardiac disease was so often unsatisfactory, or even totally wrong, because the trouble was due to debility of the heart-muscle, and because of our inability to form any correct clinical estimate of the degree of this debility. Arhythmia had been pointed to as an index of the impairment of cardiac muscle, but this was a mistake; arhythmia indicated impaired cardiac mechanism, and told us nothing about the functional competence of the muscular substance of the heart. In fact our only way of estimating the reserve power of the myocardium was the very unsatisfactory one of watching the progress of the malady. Professor Wenckebach expounded a method of measuring the reserve of cardiac power by estimations of the contractility of the heart-muscle; the method, however, though of great theoretical interest, did not admit of any practical application at the bedside.

Prof. W. T. Ritchie of Edinburgh next drew attention to "auricular flutter," a condition akin to auricular fibrillation. When fluttering, the cardiac auricles beat from 200 to 350 or even 380 times a minute; the ventricles often follow at only half that rate. He quoted cases to prove that neither auricular flutter nor auricular fibrillation deserve the gloomy connotation so commonly ascribed to them. They might last for years without harming the patient, and their establishment might even be associated with improvement in his general condition. Dr. L. F. Bishop of New York struck out a new line by attributing heart-failure to protein poisoning, and proposing to treat it by dieting and exhibiting repeated full doses of castor oil; Dr. Haig of London attributed heart-failure, *secundum artem*, to uric acid and nothing else. Of the other speakers several drew attention to the care that should be exercised in giving a bad prognosis in cases of morbus cordis. To diagnose "weak heart" as was so often done, was almost always wrong, as Professor Thayer of Baltimore, pointed out. Dr. Walsh of New York emphasized the importance of encouraging cardiac patients to think as well of their physical condition as possible.

Dr. E. Libman of New York read an account of a new form of subacute bacterial endocarditis which occurs mostly in persons who already have chronic valvular disease, a fact that suggests a relapse perhaps, rather than an infection with a new variety of microbe. The cases last from four to eighteen months, and in the great majority of cases end fatally; a few spontaneous recoveries and a few recoveries attributed to various forms of treatment have, however, been recorded. The microbe causing the endocarditis he had isolated in seventy-three out of seventy-five cases; it was almost always a streptococcus of a peculiar type, intermediate between the pneumococcus and the ordinary streptococci, and he proposed to name it the *Streptococcus mitis*. A special form of glomerular nephritis was characteristic of this new variety of endocarditis, and this was illustrated by lantern slides and explained by Dr. Baehr of New York, who was associated with Dr. Libman in his work. A special interest attaches to this form of heart disease because, as Dr. Poynton of London pointed out, it seemed to be very closely connected (if not indeed identical) with a form of rheumatic endocarditis described by himself and Paine in 1900. So far as Dr. Libman's investigations went, however, it appeared that *S. mitis* was not the same as the strains of the rheumatic diplococcus he (Dr. Libman) had been able to lay his hands on for purposes of comparison.

At the afternoon session a new and fairly simple method of obtaining simultaneously tracings of the arterial pulse, the venous pulse, and the heart-sounds was explained by Dr. R. Ohm of Berlin. Dr. Ohm's tracings showed clearly that his apparatus would be of considerable assistance in the diagnosis of certain forms of valvular heart-disease, and also for didactic purposes.

Diplococcus Endocarditis

Drs. A. Paine and F. J. Poynton of London next presented a summary of their recent work on rheumatic endocarditis. It was pointed out that the rheumatic diplococcus was capable of producing in man every form of endocarditis from the most benign simple variety to the most malignant. In animals, similarly, every variety of endocarditis could be produced by the intravenous injection of cultures of the diplococci taken from cases of rheumatic fever in human beings. Many forms of non-suppurative arthritis could be produced in animals, and a number of pictures were thrown on the screen showing the extensive circumarticular fibrosis and inflammation commonly produced; while others illustrated the fact that a typical rheumatoid arthritis, with lipping of the bones and erosion of the cartilages all complete, may result from such experimental infections of the joints in rabbits. A striking set of pictures illustrated the acute appendicitis that may follow, again in the rabbit, on the intravenous injection of rheumatic diplococci. Twenty rabbits six weeks old were inoculated with the organisms obtained from a case of rheumatic fever; nineteen developed polyarthritis, four appendicitis, one endocarditis. Microscopical sections of the inflamed appendices made it obvious that the rheumatic appendicitis of the young rabbit is in every way a replica of acute non-suppurative appendicitis in man. Necrosis of the lymph-nodules towards the periphery of the rabbits' appendix was conspicuous, followed by necrosis and disintegration of the greater part of the Lieberkühn's follicles and crypts opening into the lumen of the tube. Dr. Paine laid stress on the rapid phagocytosis of the organisms that takes place in both rheumatic rabbit and rheumatic man. He held that it accounts for much of the difficulty experienced by so many observers in isolating the rheumatic diplococcus from rheumatic patients.

Observations on the Venous Pulse

Dr. A. D. Hirschfelder of Baltimore next read his paper on various simple modes of diagnosing circulatory troubles that are commonly believed to require the use of expensive and complicated pieces of apparatus for their demonstration. Among the points he dealt with was the naked-eye observation of the venous pulse at the root of the neck. By laying the patient horizontal the internal jugular vein can generally be made to stand out in relief on the surface of the neck. Its edge and its pulsations can be thrown into relief by holding the margin of a white visiting-card parallel to its course and in close proximity to its border. This white card gives a fixed point that appears to amplify and at the same time define any pulsations that the vein may show. He illustrated the use that might be made of these pulsations in the diagnosis of various forms of irregular cardiac rhythm. For example, auricular extrasystoles can be seen to occur in pairs; ventricular extrasystoles singly, and he noted that these produce extremely large and forcible venous pulsations; in complete heart-block the number of extra auricular systoles intercalated between the ventricular beats varied in successive diastoles and was inconstant.

Discussion on Diabetes

The Monday, August 11, morning session was occupied by a very satisfactory discussion on diabetes mellitus. The subject was introduced by Dr. G. Dock of St. Louis, who went fully into the different views that have been published in the hope of clearing up its etiology. The connection of diabetes with the pancreas is well known; perhaps too much attention is paid to the pancreas in diabetes, and too little to the other organs of the body. The control exercised by the central nervous system on the sugar-producing functions of the liver is better recognized nowadays than it used to be; the fact that many spots in the brain, besides the diabetic center of Claude Bernard, give rise to diabetes on puncture, was not sufficiently recognized. Reference was made to Cushing's admirable work on the pituitary gland; its posterior lobe plays an important if indefinite rôle in the metabolism of the carbohydrates, and its glycolytic function appears to be under the control of the superior cervical ganglion of the sympathetic. Acidosis, the terminal event that brings on diabetic coma in so many cases of diabetes, was connected with decrease in the amount of carbohydrate in the diet, increased fat-metabolism, and increase in the formation of sugar from the proteins of the bodily tissues. In the treatment of the disease, now mainly a matter of dieting, it was important to secure the attention and intelligent help of the patient. Prof. C. von Noorden of Vienna followed, and gave a first-rate account of the most recent views of the way in which the carbohydrate metabolism of the body is regulated. Needless to say, this regulation is highly complicated. Professor von Noorden presented to his audience a diagrammatic scheme in which the control of the glycogenic function of the liver was set out. The pancreas is the organ that tends to keep the consumption of sugar down, the chromaffin system (or, to mention its chief constituent, the suprarenal gland) tries to increase the consumption. But the pancreas is in turn controlled by the thyroid gland, the parathyroids, and the hypophysis; while the chromaffin system is under the control of the central nervous system. All of these controls, except that of the central nervous system, are exercised by the medium of the secretion of the various glands concerned, conveyed about the body by the blood-stream. The regulation of the glycogenic function of the liver by the pancreas and chromaffin system in the normal subject is such that the blood contains from six to eight parts of glucose per ten thousand. In diabetes this quantity is increased, either because the inhibiting power of the pancreas is weakened, speaking generally, or because the augmenting power of the chromaffin system is increased. In Claude Bernard's diabetic puncture of the brain, for example, the glycosuria is due to the central stimulation of the chromaffin system. Acidosis is fatal by removing the ammonia and alkaline bases from the body in excessive amounts; diabetic coma is the expression of alkaline poverty of the tissues. Coming to the treatment of diabetes, Professor von Noorden said that drugs are but little given to diabetics as such nowadays; the treatment consists almost entirely in setting each patient to live on exactly the diet that suits him best. A sugar-free diet is first given to reduce the glycosuria to the lowest possible value; in favorable cases the sugar disappears from the urine. The next step is to ascertain by direct experiment what is the limit of the patient's tolerance for carbohydrate; sugary or starchy foods are added cautiously to the dietary, and their effect in producing glycosuria is carefully watched. These tolerance tests require the constant supervision and regulation of the physician. It is most important that the body's sugar manufactories should at no time be overburdened; the urine must be kept as free from sugar as possible, or the disease will progress. Too much must not be expected from such treatment; there always will be cases of diabetes mellitus that progress in spite of the greatest care, because the lesions on which the disease depends are sometimes inevitably progressive. In severe cases he advised the adoption of alternating periods of carbohydrate feeding and carbohydrate starvation. Most cases should have plenty of fat in their diet; in severe cases two or three ounces of whisky should be given every day. Professor von Noorden described his well-known "oatmeal cure," which was found to do good, but for what reason was not understood. Banana cures and flour cures, worked on similar lines, had also been employed successfully. Dr. Cammidge of London introduced a new urinary test—the iodin coefficient of the urine—whereby it was possible sometimes to foresee some weeks beforehand the appearance of sugar in the urine of a patient with pancreatic disease. Lieut.-Col. K. Prasad, I.M.S., gave an account of diabetes in India; it is not a rare disease among the Hindus, and their medical men treat it mainly by drugs that soothe the nervous system. Dieting did not occupy a large place in the treatment, and only a very mild degree of limitation was put on the consumption of carbohydrates. An uniformly bad prognosis was given. Dr. Labbé of Paris was on well-trodden ground when he read a paper proposing to divide diabetics into two classes clinically, the fat diabetics and the thin. Professor Saundby of Birmingham spoke of a number of practical points that should be kept in mind by practitioners who have to treat diabetes. He urged that too much meat should not be given, for too much meat was almost as bad as too much carbohydrate. It was important to remember that many of the diabetic foods advertised as free from starch were not by any means free from it; fraudulent manufacturers of such foods were only too common. He could not agree with Professor von Noorden's advice to give large quantities of alcohol to these patients.

Upholding Vivisection

At the beginning of the morning session, Tuesday, August 12, the president, Sir William Osler, put to the crowded audience a motion affirming the importance and necessity of vivisection, carried out, as it is, under due control, for the progress of medical science. The motion was carried unanimously.

Discussion on Arthritis

Prof. L. F. Barker of Baltimore opened the day's discussion on "The Differentiation of the Diseases Included Under the Title Chronic Arthritis." Professor Barker gave his hearers an exhaustive survey of the history of the nomenclature that has burdened and confused these chronic joint-troubles. In the earliest days any acute disease of the joints was called arthritis, any chronic disease was called gout. G. D. Baillou about 300 years ago reversed this, describing chronic conditions as arthritis, acute inflammations of the joints as rheumatism. Rheumatoid arthritis was a name invented in 1859 by Garrod. Many classifications of chronic arthritis had been attempted on pathological or etiological or morphological bases, or, worse still, by the employment of mixed criteria. He distinguished five main types: (1) the gouty; (2) the nervous; (3) arthritis deformans; (4) chronic infective arthritis; (5) primary progressive chronic arthritis apparently not due to any infection. He dwelt on the fact that in proportion as our knowledge increases, so are we able to transfer cases from group (5) with its unknown etiology, to group (4) in which the bacteria causing the arthritis are known. Complete knowledge, he believed, would some day enable us to empty group (5) into group (4) altogether: at present, however, this could not be done. It was a remarkable thing that cases falling into group (5) had been reported from all countries. He was followed by Prof. F. von Müller of Munich, who gave a very full and most instructive account of the pathology of chronic arthritis. A special feature of his address was the skill with which he figured on the black-board the many morbid changes that might be met with in such conditions. A number of the observed changes were of a degenerative rather than inflammatory nature, particularly in those forms of chronic arthritis in which hypertrophy is a marked feature. He drew attention to the curious arthritic and periostitic changes not rarely met with in patients suffering from noninflammatory mediastinal new growths. Dr. Preston King of Bath deplored the unhappy terminology employed in descriptions of chronic arthritis, and agreed with Professor Barker in believing that his fourth and fifth groups would one day be merged. Professor Singer of Vienna spoke of the care needed in discriminating those cases of chronic arthritis due to tuberculosis or syphilis from the other varieties. Dr. J. B. Burt of Buxton emphasized the important actions of exercise and work in determining the exact nature of the changes produced in chronically inflamed joints. Similar changes (he called the phalanx of a London cab horse to witness) might be produced by overwork alone: he asked how many of the hypertrophic changes in the bones of chronic arthritis might well be due to the work done, the use made of the joint, and not to the inflammation at all?

Dr. Hale White of London expressed his belief in the unity and existence of a chronic arthritis that has been recognized in this country for more than half a century under the name of rheumatoid arthritis. It was correctly placed by Professor Barker in his fifth group of cases: Dr. Hale White believed that it was due to a specific microbe that had never been isolated hitherto, and pointed out that the primary change, seen in early cases of rheumatoid arthritis, was confined to the synovial membrane. Dr. Poynton of London pointed out that whereas in days gone by chronic arthritis was attributed to errors of metabolism, at the present time the tendency was to attribute it to infection in every case. He believed that the truth lay somewhere between these two views. Injected intravenously into the rabbit, the rheumatic diplococcus isolated by Paine and himself was capable of producing any and every variety of chronic arthritis; further, the effusions withdrawn from such joints would often prove sterile, although one could have no reasonable doubt that they were in reality infected with the rheumatic streptococcus. Dr. A. E. Garrod of London deprecated the want of an international nomenclature, by the use of which the confusion at present reigning in the description and classification of cases of chronic arthritis by the writers of different nationalities now prevalent might be got rid of. Modern treatment was undoubtedly better than the old, as was proved by the smallness of the number of severe types of chronic arthritis to be seen nowadays.

(To be continued)

Marriages

Henry Carl Richter, M.D., U.S.P.H.S., Calexico, Cal., to Miss Carrie Harrison Hamill of Globe, Ariz., at San Diego, August 4.

Robert Blucher McCay, M.D., to Miss Nellie Glenn Farnham, both of Sunbury, Pa., at Philadelphia, August 18.

Charles W. Huff, M.D., Jackson, Wyo., to Miss Edna R. Cearfoss of Baltimore, at Cheyenne, Wyo., June 16.

Joseph James Rowan, M.D., to Miss Alice Butterfield, both of Dubuque, Ia., at Cedar Rapids, Ia., August 11.

Otto John Hermann, M.D., Boston, to Miss Alice Hamilton O'Connell of Jamaica Plain, Boston, August 18.

Luther Milton Powers, M.D., to Mrs. Mary R. Byrne, both of Los Angeles, at Piedmont, Cal., August 6.

Arminus Blair Lyon, M.D., Ulster, Pa., to Miss Cecile M. Shumway of Sayre, Pa., August 14.

Hugh Augustine Riley, M.D., to Miss Clotilde L. Dunne, both of New York City, July 28.

Ralph Stephen Fisher, M.D., to Miss Hazel Therkelsen, both of Portland, Ore., August 9.

Deaths

John J. Mulheron, M.D. University of Michigan, Ann Arbor, 1869; and once president of the Wayne County Medical Society; a member of the Michigan State Medical Society; at one time owner and publisher of the *Chicago Medical Review;* in 1886 a member and president of the Detroit Common Council and president of the Wayne County Supervisors and a member and president of the Board of Estimates in 1888; died at his home in Detroit, August 2, aged 67.

William R. Mattox, M.D. Rush Medical College, 1888; formerly a member of the American Medical Association; once coroner of Vigo County, Wis.; for five years president of the Vigo County Medical Society and for the time president of the Union Hospital Board, Terre Haute: died at his home in that city, August 2, from nephritis, aged 58. A large delegation represented the Vigo Medical Association at the funeral.

William Basilio Mackie, M.D. Harvard Medical School, Boston, 1862; for half a century a practitioner of Boston and formerly on the staff U. S. Marine Hospital, Chelsea, the Boston City Dispensary and the Boston City Hospital; a member of the Massachusetts Medical Society; vice-consul of Venezuela at Boston: died at the home of his son in Brookline, August 8, aged 79.

Albert Steuben Hotaling, M.D. College of Physicians and Surgeons, Baltimore, 1894; a fellow of the American Medical Association; professor of obstetrics in the Syracuse University College of Medicine; one of the most prominent practitioners of Syracuse; died at the Hospital for Women and Children in that city, August 8, a day after an operation for appendicitis, aged 40.

Clinton Clarence Miller, M.D. New York University, New York City, 1877; for five years acting assistant surgeon in the Army with station at Fort Sisseton, N. D.; a resident of St. Paul since 1856; for many years a member of the staff of the City Hospital and physician to the City Workhouse; died at his home, August 12, from paralysis, aged 59.

S. Sollers Maynard, M.D. Jefferson Medical College, 1860; a fellow of the American Medical Association; for more than fifty years a practitioner of Maryland; once president of the Farmers and Mechanics' Bank; physician to the Montevue Hospital and city health officer; died in his office in Frederick, August 3, from angina pectoris, aged 78.

George Raynolds Stearns, M.D. New York Homeopathic Medical College, New York City, 1878; a member of the staff of the Buffalo Homeopathic Hospital and formerly medical director of the Ingleside Home; was struck by a street car while crossing a street in Buffalo August 8, and died a few hours later, aged 55.

Eugene Carson Hay, M.D. University of Virginia, Charlottesville, 1890; a fellow of the American Medical Association, and a member of the Association of Military Surgeons of the United States; a pioneer resident of Hot Springs; died at his country home near that city, August 6, after a long illness, aged 48.

Calvin Ingram Fletcher, M.D. Medical College of Indiana, Indianapolis, 1880; a fellow of the American Medical Association, and a well-known physician of Indianapolis, while exploring a crevasse in Blackfoot glacier, Glacier Park, Mont., August 19, fell over a 600-foot precipice, and was instantly killed.

C. C. Garrett, M.D. Atlanta (Ga.) Medical College, 1872; for twenty-four years a member of the Douglas County (Ga.) Board of Education and for sixteen years of that time, chairman; mayor or councilman of Lithia Springs since the incorporation of the town; died at his home, August 5, aged 63.

Philip Scholz, M.D. St. Louis College of Physicians and Surgeons, 1889; a fellow of the American Medical Association; a pioneer druggist and physician of St. Louis; who was struck by an automobile while alighting from a car, July 27; died at St. Mary's Infirmary, St. Louis, July 31, aged 72.

Thomas William Bailey, M.D. University of Pennsylvania, Philadelphia, 1902; a member of the Medical Society of the State of Pennsylvania; of Philadelphia; for many years consulting surgeon to St. Agnes Hospital; died in that institution, August 1, from typhoid fever, aged 34.

Oliver Livingston Jones, M.D. Bellevue Hospital Medical College, 1871; a retired practitioner of New York City; died in the Polyclinic Hospital, New York City, August 9, from the effects of bullet wounds of the head, self-inflicted it is believed with suicidal intent, aged 63.

Ovid Allen Hyde, M.D. Eclectic Medical College of the City of New York, 1884; for twenty-one years a member of the faculty of his alma mater and consulting surgeon on the dispensary staff of the college; died at his home in Queens, Long Island, August 5, aged 61.

Lemuel Austin Ferry, M.D. University of Georgetown, Washington, D. C., 1879; formerly a member of the American Medical Association; a member of the Illinois State Medical Society; died at his home in Geneseo, June 14, from heart disease, aged 69.

John Bohl, M.D. Cincinnati College of Medicine and Surgery, 1859; a member of the Ohio State Medical Association and one of the organizers of the Washington County Medical Society; died at his home in Watertown, August 13, from senile debility, aged 84.

Stephen Charles De Veny, M.D. University of Pennsylvania, Philadelphia, 1871; a member of the Illinois State Medical Society and a resident of Chicago for more than forty years; died at his home in that city, August 16, from nephritis, aged 68.

Adin Wilson Mitchell, M.D. Cincinnati College of Medicine and Surgery, 1880; a member of the Ohio State Medical Association; physician to the Brown County Children's Home; died at his home in Georgetown, O., May 24, aged 65.

James Thacker Boutelle, M.D. Harvard Medical School, 1871; a member of the Medical Society of Virginia; health officer of Elizabeth City County; died at his home in Hampdon, August 7, from a nervous breakdown, aged 68.

Francis Xavier Dooley, M.D. Georgetown University, Washington, D. C., 1865; a member of the Medical Society of the District of Columbia, and also a druggist; died at his home in Washington, August 10, aged 72.

Robert T. Shaw, M.D. Jefferson Medical College, 1877; of Denver; formerly a member of the Colorado Legislature and a graduate in theology; died in St. Luke's Hospital, Denver, August 5, from uremia, aged 59.

William Frederick Beyer, M.D. University of Michigan, Ann Arbor, 1912; of Detroit; died in Harper Hospital, July 22, from septicemia, contracted while an intern in the University Hospital, Ann Arbor, aged 24.

Henry Skelton Carter, M.D. College of Physicians and Surgeons, New York City, 1872; a practitioner of New York City; died suddenly at his home in Tarrytown, N. Y., July 2, from angina pectoris, aged 64.

Edward Munroe Lane, M.D. Bellevue Hospital Medical College, 1892; of Pawtucket, R. I.; died in the Rhode Island Hospital, Providence, July 31, after an operation for disease of the intestine, aged 46.

Alexander A. Staats, M.D. Cincinnati College of Medicine and Surgery, 1868; a member of the Ohio State Medical Association; died at his home in Summerfield, May 16, from heart disease, aged 70.

Tence Francis Massey, M.D. Eclectic Medical Institute, Cincinnati, 1866; also a druggist; of Medaryville, Ind.; died in St. Elizabeth's Hospital, Lafayette, Ind., July 11, from septicemia, aged 73.

Bernard Francis Dennis, M.D. University of Buffalo, N. Y., 1899; of Buffalo; a fellow of the American Medical Association; died in a hospital in Oil City, Pa., about August 1, aged 36.

Elie-Jean B. Hazzard, M.D. Eclectic Medical College of the City of New York, 1886; also an attorney; died at his home in Lawrence, Kan., from atrophic cirrhosis of the liver, aged 72.

Henry M. Swigert, M.D. Cincinnati College of Medicine and Surgery, 1880; a veteran of the Civil War; died at his home in Hastings, Neb., August 5, from cerebral hemorrhage, aged 66.

Charles A. Sweet, M.D. College of Physicians and Surgeons of Chicago, 1887; a member of the Michigan State Medical Society; died at his home in East Jordan, May 4, aged 53.

James Pendleton Carter, M.D. University of Maryland, Baltimore, 1852; for 35 years a practitioner of Berkeley County, W. Va.; died at his home in Gerrardstown, August 4, aged 83.

James E. Overstreet, M.D. Southern Medical College, Macon, Ga., 1893; formerly mayor of Baxley, Ga., and president of the Citizens' Banking Association; died at his home, August 3.

Clarence Benjamin Wilson, M.D. University of Michigan, Ann Arbor, 1890; a member of the Vermont State Medical Society; died at his home in Bradford, May 31, aged 47.

Harry Daniel Abbott, M.D. Tufts College Medical School, Boston, 1904; a fellow of the American Medical Association; died at his home in Danvers, Mass., July 16, aged 33.

Andrew J. Shrader (license, Ohio); also an attorney; for many years a practitioner of Columbus; died in Milton Center, O., June 19, from senile debility, aged 93.

George Elbridge Swan, M.D. New York Homeopathic Medical College, 1866; in 1881, mayor of Beaver Dam, Wis.; died at his home in that place August 10, aged 75.

George W. Cornish, M.D. Detroit College of Medicine, 1894; a member of the Michigan State Medical Society; died at his home in Lawton, August 8, aged 53.

Hiram S. Broiles, M.D. University of Nashville, Tenn., 1873; for two terms mayor of Fort Worth, Tex.; died at Fort Leavenworth, Kan., August 7, aged 68.

Charles Owen Patton, M.D. Bellevue Hospital Medical College, 1886; died at his home in McFall, Mo., August 1, aged 58.

R. L. Rylee, M.D. Georgia College of Eclectic Medicine and Surgery, Atlanta, 1891; died at his home in Bogart, July 25.

Samantha Smith (license, Mo., 1883); of Kansas City, Kan.; died in State Hospital No. 2, St. Joseph, Mo., July 27.

Silas H. Cardwell (license, Arkansas, 1903) died at his home in Hot Springs, August 1, aged 74.

The Propaganda for Reform

In This Department Appear Reports of the Council on Pharmacy and Chemistry and of the Association Laboratory, Together with Other Matter Tending to Aid Intelligent Prescribing and to Oppose Medical Fraud on the Public and on the Profession

LEMMON'S RHEUMATISM CURE

Secretary of a Coal Company Offers to Instruct Physicians—Price One Dollar

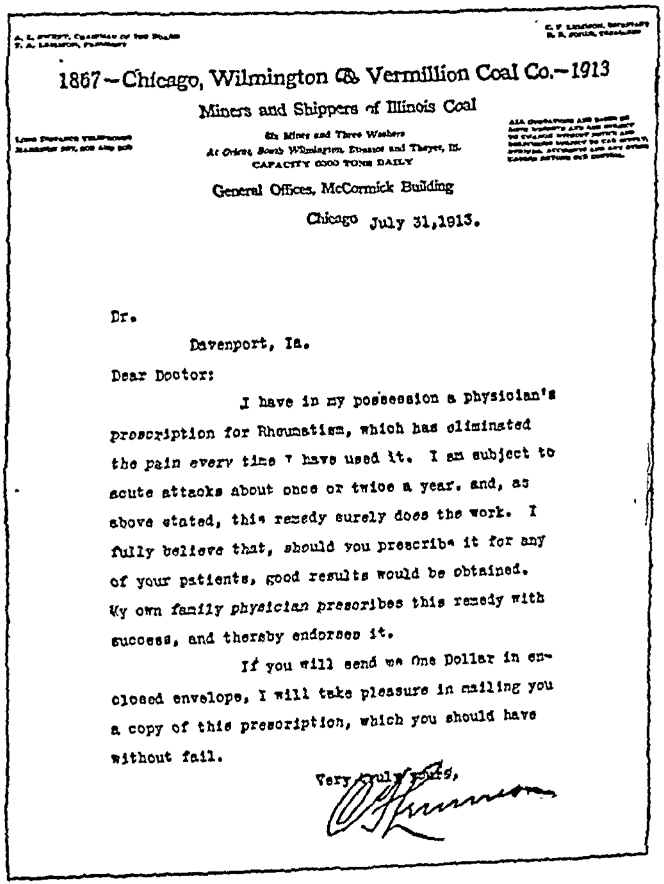
On August 4 and 5 the Propaganda for Reform department received an extraordinarily heavy mail. In addition to the usual batch of inquiries regarding quacks and nostrums about seventy letters were received from Iowa physicians. Most of these letters enclosed a typewritten letter on the stationery of the Chicago, Wilmington and Vermillion Coal Company, signed by the secretary of that company, C. F. Lemmon. Mr. Lemmon's letter to the physicians of Iowa ran thus:

> *"Dear Doctor:* I have in my possession a physician's prescription for Rheumatism, which has eliminated the pain every time I have used it. I am subject to acute attacks about once or twice a year, and, as above stated, this remedy surely does the work. I fully believe that, should you prescribe it for any of your patients, good results would be obtained. My own family physician prescribes this remedy with success, and thereby endorses it.
>
> "If you will send me One Dollar in enclosed envelope, I will take pleasure in mailing you a copy of this prescription, which you should have without fail."

The physicians of the Hawkeye state are evidently poor game for the hunter of "suckers." Some of their comments on Mr. Lemmon's letter are worth quoting:

"I didn't bite. What is the graft?"

"What kind of a graft is this fellow trying to work?"



1867—Chicago, Wilmington & Vermillion Coal Co.—1913

Miners and Shippers of Illinois Coal

Six Mines and Three Washers

General Offices, McCormick Building

Chicago July 31,1913.

Dr.

Davenport, Ia.

Dear Doctor:

I have in my possession a physician's prescription for Rheumatism, which has eliminated the pain every time I have used it. I am subject to acute attacks about once or twice a year, and, as above stated, this remedy surely does the work. I fully believe that, should you prescribe it for any of your patients, good results would be obtained. My own family physician prescribes this remedy with success, and thereby endorses it.

If you will send me One Dollar in enclosed envelope, I will take pleasure in mailing you a copy of this prescription, which you should have without fail.

Very truly yours,

Photographic facsimile of the letter sent by Mr. Lemmon to the physicians of Iowa offering to sell a prescription for rheumatism. The name of the recipient of this letter was deleted before photographing it.

"I notice his name is Lemmon. I wonder if he is trying to hand me one."

"The secretary of this firm certainly must think physicians are an easy mark."

"It surely is a unique sideline for a coal company."

And so on. As it seemed probable that Mr. Lemmon would extend his Get-Rich-Quick Wallingford operations, it seemed worth while to head off his "game." THE JOURNAL accordingly asked some of the Iowa physicians who had been favored with Mr. Lemmon's invitation to send the secretary of the Chicago, Wilmington and Vermillion Coal Company the dollar necessary to obtain the prescription. This was done, but alas, the medical profession is to be kept in the dark regarding this marvelous remedy, for the money orders sent to Lemmon were returned to the senders with a short note to this effect:

> "Yours enclosing $1.00 for rheumatism prescription received. Am obliged to return same to you for the reason that it now appears to me that I cannot fairly do as proposed."

This note, it should be said, while a typewritten one and signed by Mr. Lemmon, was not on the stationery of the coal company. It was on a plain sheet of paper.

What brought about Mr. Lemmon's change of heart in this matter we do not know. It is barely possible that the president of the Chicago, Wilmington and Vermillion Coal Company, who is Mr. C. F. Lemmon's father, may have found that his company was receiving an amount of notoriety that was not healthy for a legitimate business.

Correspondence

Cerebrospinal Fluid in Brain Tumors

To the Editor:—In THE JOURNAL of July 26, 1913, p. 265, Dr. M. J. Karpas states that "in tumor of the brain of non-luetic genesis the fluid is free from pathologic findings." I may say without going into the literature for quotations that a number of cases of non-luetic brain tumors have been reported in which the spinal fluid showed a positive result from Noguchi's modification of the Wassermann test and increased cell-count. I have had two such cases myself. In one of these cases in which I had originally made a diagnosis of brain tumor I revised the same to cerebrosyphilis on the basis of the laboratory report. The necropsy showed non-specific tumor at the pontocerebellar angle. Therefore, that the spinal fluid may in cases of non-specific brain tumor show increased cell-count and positive Noguchi test appears to me as a matter of very considerable clinical importance.

THEODORE DILLER, M.D., Pittsburgh, Pa.

[The foregoing letter was referred to Dr. Karpas, who replies:]

As a general rule, the cerebrospinal fluid in brain tumors of a non-syphilitic etiology is usually free from abnormal constituents. However, in cases in which the fluid shows an increase of albumin or lymphocytosis, one must think of two possible conditions: (1) a syphilitic factor in addition to the neoplasm, and (2) the production of some irritation which may result from the tumor growth coming into close contact with the meninges, causing the pathologic phenomena of the cerebrospinal fluid. Tumors in the cerebellopontine angle may cause sufficient irritation of the meninges to account for the increase of cells and globulin content. In my experience with brain tumors, I have found no pathologic conditions of the cerebrospinal fluid. Dr. Diller's suggestions are worthy of attention—indeed, our knowledge of the cerebrospinal fluid in tumors is not at all exhausted. The more records of careful fluid examinations of cases of brain tumors with necropsies and operations, the more light will be shed on this vital question.

MORRIS J. KARPAS, M.D., New York.

Data Requested on Great Artists and Famous Anatomists

To the Editor:—For several years I have been trying to secure material for a monograph on great artists and famous anatomists. Will you kindly print this letter, in the hope that some of your readers may give me data concerning this interesting subject?

JAMES MOORES BALL, M.D., 4500 Olive St., St. Louis.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

THE NEW CANADIAN MEDICAL PRACTICE ACT

To the Editor:—What are the qualifications for practicing in Alberta or Saskatchewan? Is the new Canadian medical practice act now in operation and does it apply to all parts of the Dominion? What is the act? CANADIAN.

ANSWER.—The Medical Council of Alberta admits to its register any one who presents a certificate from the registrar of the University of Alberta, showing that the holder is duly qualified. A standard high-school education and a four years' course in a recognized medical college are required for those graduating prior to June 1, 1913. For those graduating after that date the preliminary education required must be equivalent to matriculation in the University of Alberta, and the applicant must have completed a five-year medical course, including the preliminary year in physics, chemistry and biology. For osteopaths the preliminary requirements and the examination in all the common subjects are the same as for physicians. Examinations are written and oral. The examination fee is $50; registration fee, $50; annual assessment, $2. The registrar of the Council is Dr. G. Macdonald, Calgary, Alberta.

In Saskatchewan the requirements are practically the same as in Alberta. The registrar of the Medical Council is Dr. G. A. Charlton, Regina, Saskatchewan.

The new Canadian practice act is now in effect and the register of the Medical Council of Canada was opened July 1 of this year. The act provides that any person already licensed in any of the provinces who has been in practice for ten years may register under certain conditions. Those licensed less than ten years may register when the ten-year period has been completed. Other candidates may, if otherwise qualified, take the examination of the Medical Council of Canada, the passing of which will entitle them to practice medicine in any part of the Dominion. The first Dominion examination will be held in Montreal, October 7 of this year.

INCONSISTENT PRESCRIPTION

To the Editor:—Please comment on the enclosed prescription as to compatibility and physiologic effects of the different ingredients.

K. I.	ʒ ii
Hydrarg. chlor.	gr. i
Tr. gelsemium.	ʒ i
Tr. aconite	m. xvi
Strych. sulph.	gr. ⅓
Chloral hydrate	ʒ iii
Liq. pot. ars.	ʒ i
Syr. *tolu*	
Aq. mentha pip. āā qs	℥ ii

M. Sig.: ʒ i in aq q 3 hrs.

G. S. C.

ANSWER.—Such a prescription affords opportunity for much criticism. The presence of nine ingredients marks it at once as a *specimen of disgraceful* polypharmacy. There are many evident inconsistencies. The mixture of potassium iodid and mercuric chlorid forms a reagent for alkaloids which would probably precipitate the strychnin and might give rise to fatal poisoning. Perhaps the chloral hydrate is added as an antidote to possible strychnin poisoning. There is no reason for combining together such opposite agents as strychnin and tincture of aconite or tincture of gelsemium.

THEORY OF OSTEOPATHY AND CHIROPRACTIC

To the Editor:—I wish to inform myself thoroughly in regard to the actual theory and therapeutics of osteopathy and of chiropractic, so as to meet, intelligently, arguments made in favor of these cults by my patients. E. A. H., California.

ANSWER.—The following books and articles may be referred to:

OSTEOPATHY

Barber: Osteopathy, Janish, Kirksville, Mo., price $3.
Burns: Basic Principles of Osteopathy, Louisa Burns, Los Angeles, price $4.50.
Clark: Diseases of Women, A. S. O. Book Co., 602 W. Jefferson St., Kirksville, Mo., price $5.
Craven: Physical Diagnosis, A. S. O. Book Co., 602 W. Jefferson St., Kirksville, Mo., price 25 cents.
Davis: Osteopathy, Chicago Medical Book Co., price $5.
Goetz: Osteopathy, Nature's Cure Co., Cincinnati, price, $2.

Hazzard: Practice of Osteopathy, A. S. O. Book Co., 602 W. Jefferson St., Kirksville, Mo., price $3.
Hulett: Principles of Osteopathy, Hulett, Cleveland, price $3.50.
Laughlin: Anatomy, A. S. O. Book Co., 602 W. Jefferson St., Kirksville, Mo., price $6.50.
McConnell and Teal: Practice of Osteopathy, A. S. O. Book Co., 602 W. Jefferson St., Kirksville, Mo., price $5.
Michel: Arterial, Venous and Nervous Chart, Michel Co., Cleveland, price $3.
Murray: Osteopathy for the Physician, Charles Murray, Elgin, Ill., price $3.
Still: Philosophy of Osteopathy, A. S. O. Book Co., 602 W. Jefferson St., Kirksville, Mo., price $5.50; *Research and Practice of Osteopathy*, A. S. O. Book Co., 602 W. Jefferson St., Kirksville, Mo., price $6.
Tasker: Principles of Osteopathy, A. S. O. Book Co., 602 W. Jefferson St., Kirksville, Mo., price $5.
Woodall: Osteopathic Gynecology, A. S. O. Book Co., 602 W. Jefferson St., Kirksville, Mo., price $3.50.

CHIROPRACTIC

What is Chiropractic? Transcript of evidence in State of Wisconsin vs. S. R. Jansheski. American Medical Association Press, 1911.
The Legal Aspects of Chiropractic, American Medical Association Press.
Requirements as to Having and Recording Licenses.—Violation of Statute by Chiropractics, THE JOURNAL, March 29, 1913, p. 1021.
Law Violated by Chiropractor, THE JOURNAL, April 12, 1913, p. 1181.
Construction of Medical Practice Act—Chiropractics not "Other Agency," THE JOURNAL, April 20, 1913, p. 1227.
Rice, G. W.: *Pseudomedicine*, THE JOURNAL, Feb. 3, 1912, p. 360.
McGee, R. P.: Chiro-Practice—What is it? *Denver Med. Times and Utah Medical Jour.*, May, 1912.
Constitutionality and *Construction* of Medical Practice Act—Chiropractor Violates Law, THE JOURNAL, July 28, 1911, p. 412.
Constitutionality of Medical Practice Acts. Chiropractic a Practice of Medicine, THE JOURNAL, Aug. 5, 1911, p. 501.
Another Court Holds Chiropractic a Practice of Medicine, THE JOURNAL, Sept. 9, 1911, 924.
Sufficiency of Indictment of Chiropractic, THE JOURNAL, Nov. 25, 1911, p. 1795.

LITERATURE ON COLEY'S TOXINS IN SARCOMA

To the Editor:—I wish to use Coley's toxin or Coley's antisarcoma serum in one of my cases. Will you please tell me where I can get it and how it should best be administered? I can find nothing definite concerning it in any literature that I have. A loan of any articles, reprints or magazines written in English would be appreciated and the literature will be promptly and carefully returned. J. E. SNYDER, M.D., Cooperstown, Ill.

ANSWER.—Erysipelas and prodigiosus toxins (Coley). Prepared by Parke, Davis & Co., Detroit, Mich. The preparation is described in N. N. R., 1913, page 236.

The toxins are injected in gradually increasing doses, at first in a part of the body removed from the tumor and later, if possible, into the tumor itself.

The following articles have appeared on this subject:

Hunt, E. R.: Case of Recurrent Carcinoma of Parotid Gland Treated with Coley's Fluid, *Lancet*, London, June 17, 1911; abstr., THE JOURNAL, July 15, 1911, p. 252.
Green, R. M.: Use of Coley's Toxins in Treatment of Sarcoma, *Boston Med. and Surg. Jour.*, July 6, 1911; abstr., THE JOURNAL, July 22, 1911, p. 341.
Coley, W. B.: Recent Cases of Inoperable Sarcoma Successfully Treated with Mixed Toxins of Erysipelas and Bacillus Prodigiosus, *Surg., Gynec. and Obst.*, August, 1911; abstr., THE JOURNAL, Sept. 9, 1911, p. 925.
Oliver, J. C.: Results Obtained from Use of Coley's Toxins in Treatment of Sarcoma, *Ohio State Med. Jour.*, Oct. 15, 1911; abstr., THE JOURNAL, Nov. 18, 1911, p. 1724.
Large, S. H.: Four Cases of Sarcoma of the Nose and Throat Treated with Coley's Toxins, *Cleveland Med. Jour.*, April, 1911; abstr., THE JOURNAL, March 27, 1911, p. 1615.
Hill, H. K.: Retroperitoneal Lymphosarcoma Treated with Coley's Fluid, *Arch. Pediat.*, September, 1912.
Greenwood, H. H.: Melanotic Sarcoma Treated with Coley's Fluid, *Lancet*, London, Sept. 28, 1912.
Duncan, R. B.: Treatment of Inoperable and Operable Sarcomatous Growths by Coley's Fluid, *Australian Med. Jour.*, March 2, 1912.
Miketta, F. H.: Osteosarcoma of Fourth Cervical Vertebra Treated by Coley's Serum, *Lancet-Clinic*, May 28, 1910.

CASE OF AMNIOTIC ADHESION

To the Editor:—Recently I had an obstetric case in which the head of the child was adherent to the placenta and the uterine wall. Are there reports of similar cases? What books or papers can I consult on the subject? R. VORSANGER, M.D., Chicago.

ANSWER.—Ballantyne's "Antenatal Pathology and Hygiene," ii, contains a full description of amniotic adhesions. Frequently the amniotic bands pass from the fetal side of the placenta to the head and so it appears that the head is adherent to the placenta. In these cases there are generally other malformations present. Such cases as reported should be described in detail and pictures taken of them. Then they might be of value in determining some of the problems of teratogenesis, that is, the origin of monsters.

POTASSIUM PERMANGANATE SOLUTION

To the Editor:—1. How much potassium permanganate is required to make a quart of 1:2,000 and 1:5,000 solutions? How is the amount of potassium permanganate determined in order to make any amount and of any strength of solution?

2. What health resorts are best for patients afflicted with kidney and liver diseases?

3. (*a*) How long after rupture of hymen can the carunculae myrtiformes be seen? (*b*) Is it possible to state with any degree of accuracy how long the hymen has been ruptured by presence or absence of carunculae myrtiformes? SUBSCRIBER.

ANSWER.—1. For a quart of a solution of 1:2,000 use 7½ grains, and for a quart solution of 1:5,000 use 3 grains. One quart is equivalent to 14,600 grains, so that 15 grains to the quart equals approximately 1:1,000.

2. Those with a mild equable climate.

3. (*a*) The carunculae myrtiformes are the results of labor and not of the rupture of the hymen. (*b*) No.

THE CAUSE OF "PINK-EYE"

To the Editor:—Kindly inform me whether the germ which causes "pink-eye" has been demonstrated, and if so, what it is. E. HOCHHEIMER, M.D., New York.

ANSWER.—"Pink-eye" is a popular term applied to an acute contagious conjunctivitis which is due to an organism first described in 1883 by Robert Koch and later by Weeks and hence called the Koch-Weeks bacillus. It is a very small organism, difficult to cultivate. Cultures of it reproduce the disease when placed on the human conjunctiva.

REMOVAL OF SILVER AND IODIN STAINS FROM FINGERS

To the Editor:—Often the fingers are accidentally stained by nitrate of silver, by tincture of iodin and by bacterial stains, much to the annoyance of the physician. Silver stains, recent or old, are effectually removed by tincture of iodin. Stains from the latter drug are immediately removed by aqua ammoniae. Many of the bacterial stains, as Loeffler's blue, gentian violet and carbol fuchsin are decolorized by acid alcohol.
P. G. SKILLERN, JR., M.D., Philadelphia.

ANSWER.—A solution of sodium thiosulphate is better than ammonia-water to remove iodin stains.

MEMBRANOUS CROUP AND LARYNGEAL DIPHTHERIA

To the Editor:—1. What is the [illegible] opinion as to the identity of membranous croup and [illegible]? 2. Is a membranous laryngitis always diphtheritic? C. G. H., Arkansas.

ANSWER.—1. They are usually regarded as identical. 2. No. About one-seventh of the cases are due to other organisms, chiefly streptococci.

ANSTIE'S LIMIT IN ALCOHOLISM

To the Editor:—Please tell me what is understood as Anstie's limit in alcoholism. I meet the term in life insurance and cannot find it explained anywhere.
S. C. BROADSTREET, M.D., Mt. Pleasant, Texas.

ANSWER.—Anstie's limit is the amount of alcohol oxidized per day by the normal organism, and it is put at 1½ ounces.

RED CROSS INSIGNIA AND THE SPEED LIMIT

To the Editor:—Can the city authorities lawfully hold up a doctor's car, carrying a red cross, and fine the owner for exceeding the speed limit? G. A. Z.

ANSWER.—Yes.

The Influence of Mucomembranous Colitis on Health.—Mucomembranous colitis is not a disease that directly destroys life, but it kills health and happiness. Patients who suffer from it and go unhealed are apt to drift into a state of chronic invalidism, never really well, spending most of their time on the sofa, and with all their thoughts, as some one has said, revolving round the umbilicus—a condition which is sometimes worse than death.—Robert Hutchison in *Clinical Journal.*

Medical Economics

This Department Embodies the Subjects of Post-graduate Work, Contract Practice, Legislation, Medical Defense, and Other Medicolegal and Economic Questions of Interest to Physicians

MODEL BILL FOR THE CONTROL OF OPHTHALMIA NEONATORUM

The Committee on Prevention of Blindness, one of the subcommittees of the Council on Health and Public Instruction, was originally organized as a Committee on Ophthalmia Neonatorum. Efforts to control this dreadful disease have always been prominently in the minds of the members of this Committee, which, in conjunction with the Medico-Legal Bureau of the Council, has prepared a preliminary draft of a model bill on this subject, the text of which appears below. This bill will be widely distributed for criticism, revised and redrafted in the light of the criticisms and suggestions received, in the hope of evolving a bill which may be endorsed as a standard by the American Medical Association and other bodies interested in public health. It should be clearly understood that this is the first draft of this measure and that criticisms are not only expected, but are earnestly desired.

A BILL FOR AN ACT ENTITLED AN ACT FOR THE PREVENTION OF BLINDNESS FROM OPHTHALMIA NEONATORUM; DEFINING OPHTHALMIA NEONATORUM; DESIGNATING CERTAIN POWERS AND DUTIES AND OTHERWISE PROVIDING FOR THE ENFORCEMENT OF THIS ACT

Section 1. Ophthalmia Neonatorum Defined.—Any condition of the eye, or eyes, of any infant shall, independent of the nature of the infection, be known as ophthalmia neonatorum, in which there is any inflammation, swelling or redness, in either one, or both eyes of any such infant, either apart from, or together with, any unnatural discharge from the eye, or eyes, of any such infant at any time within two weeks after the birth of such infant.

Section 2. Duties of Physicians, Midwives, Etc.—It shall be the duty of any physician, surgeon, obstetrician, midwife, nurse, maternity home, or hospital of any nature, parent, relative, and any person or persons attendant on, or assisting in any way, whatsoever, any woman at childbirth, or attendant on, or assisting in any way, whatsoever, any infant, or the mother of any infant, at any time within two weeks after childbirth, knowing the condition, hereinabove defined, to exist, and within six hours thereafter, to report such fact, as the State Board of Health shall direct, to the local health officer of the city, town, village, or whatever other political division there may be, within which the mother of any such infant may reside.

Section 3. Duties of the Local Health Officer.—It shall be the duty of the local health officer:

1. To investigate each case as filed with him in pursuance with the law, and any other such case as may come to his attention.

2. To report all cases of ophthalmia neonatorum, and the result of all such investigations as he shall make, as the State Board of Health shall direct.

3. To conform to such other rules and regulations as the State Board of Health shall promulgate for his further guidance.

Section 4. Duties of the State Board of Health.—It shall be the duty of the State Board of Health:

1. To enforce the provisions of this act.

2. To promulgate such rules and regulations as shall, under this act, be necessary for the purpose of this act, and such as the State Board of Health may deem necessary for the further and proper guidance of local health officers, etc.

3. To provide for the gratuitous distribution of a scientific prophylactic for ophthalmia neonatorum, together with proper directions for the use and administration thereof, to all physicians, midwives, and the like, as may be engaged in the practice of obstetrics, or assisting at childbirth.

4. To furnish prompt and gratuitous treatment to any infant infected with ophthalmia neonatorum, and to the mother of such infant as well; provided that gratuitous treatment shall not be furnished either to any infant, so infected, nor to its mother, should either, or both, such infant and its mother be under the care of a regularly qualified physician; provided further that the State Board of Health shall defray the expense of such treatment out of such sum as may be appropriated for its use.

5. To print and publish such further advice and information concerning the dangers of ophthalmia neonatorum, and the necessity for prompt and effective treatment thereof, as may be deemed fit.

6. To furnish copies of this law to all physicians, midwives, and the like, as may be engaged in the practice of obstetrics, or assisting at childbirth.

7. To keep a proper record of any and all cases of ophthalmia neonatorum, as shall be filed in their office in pursuance with this law, and as may come to their attention in any way, and to constitute such records a part of the annual report to the governor and the legislature.

8. To report any and all violations of this act as may come to their attention, to the prosecuting attorney of the district wherein said misdemeanor may have been committed, and to assist said official in any way possible, such as by securing necessary evidence, etc.

Section 5. Duties of Maternity Homes, Etc., Physicians, Etc.—It shall be the duty of all maternity homes, and any and all hospitals, etc., to maintain such records of cases of ophthalmia neonatorum as the State Board of Health shall direct. It shall be the duty of any and all maternity homes, hospitals, public and charitable institutions, midwives and the like, in addition to reporting as hereinbefore enacted, to advise, prescribe and employ, in the treatment of all cases of ophthalmia neonatorum, such prophylactic as the State Board of Health shall direct.

Section 6.—Violation of Act a Misdemeanor; Knowledge.—The failure of any and all physicians, midwives, etc., as hereinabove set forth, to report as herein prescribed, or the failure of any hospital to record, as hereinbefore enacted, or the failure of any midwife, and the like, to treat as the State Board of Health shall have directed, any and all cases of ophthalmia neonatorum, as herein prescribed, and, under such circumstances as are herewith set forth, or any or all of such violations, as the case may be, shall constitute a misdemeanor under this act, shall, on a conviction thereof, be fined, for a first offense, not to exceed $50; for a second offense, not to exceed $100, and for a third offense, and thereafter, not to exceed $200 for each violation, and, if the accused be a midwife or the like, such person shall, in the discretion of the court, suffer a revocation of license, or both fine and revocation, as the court may see fit, and if the accused be a maternity home, or the like, duly incorporated under the laws of the state, the court may, in its discretion, order a revocation of its charter; and any collusion between any official and any person, or between any others herein named, to misstate or conceal any facts which, under this act, it is essential to report correctly, shall like wise constitute a misdemeanor, and the accused shall, on a conviction, suffer a penalty such as is hereinabove enacted. The act of the agent in the scope of his employment shall be deemed the act of the principle. (Any, and all, cases of ophthalmia neonatorum, or the resultant blindness therefrom, on which the accused may have been in attendance, as hereinabove set forth, and of which no proper record has been made as herein enacted, shall be taken as *prima facie* evidence of the infection and of the intent on the part of the accused to neglect to make a proper record of such case.) It shall be the duty of the state's attorney, for the proper district, to prosecute for all misdemeanors as herein prescribed.

Section 7. Appropriation.—The sum of $———— shall be annually appropriated for the use of the State Board of

Health in enforcing and carrying out the provisions of this act. Any and all necessary and legitimate expenses that may be incurred in prosecuting a case under this act, shall, on proper showing, be met by the State Board of Health out of this appropriation. In addition thereto, all fines and penalties recovered hereunder, shall be paid into the state treasury and shall constitute a special fund for the uses and purposes of the State Board of Health as herein enacted.

SECTION 8. Emergency.—An emergency existing, this act shall take effect on its passage, as by law prescribed.

SECTION 9.—Repealing.—All acts and parts of acts, in conflict herewith are hereby repealed.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

MASSACHUSETTS: State House, Boston, September 9-11. Sec., Dr. Walter P. Bowers, Room 159, State House.

MISSOURI: Coates House, Kansas City, September 2-4. Sec., Dr. J. A. B. Adcock, State House, Jefferson City.

NEW YORK: September 23-26. Chief of Examinations Division, Mr. Harlan H. Horner, Department of Education, Albany.

Ohio April and July Reciprocity Reports

Dr. George H. Matson, secretary of the Ohio State Medical Board reports that at the meetings held April 15 and July 1, 1913, 32 candidates were licensed through reciprocity. The following colleges were represented:

LICENSED THROUGH RECIPROCITY APRIL 15, 1913.

College	Year Grad.	Reciprocity with
Howard University, Washington	(1912)	W. Virginia
College of Physicians and Surgeons, Chicago	(1905)	Indiana
Rush Medical College	(1912)	Minnesota
Kansas Medical College	(1905)	Kansas
College of Physicians and Surgeons, Baltimore (1910) (1911)		W. Virginia
University of Maryland	(1912)	Maryland
University of Michigan, Department of Medicine and Surgery (1905) (1909) (1911)	(1912)	Michigan
University of Michigan, Homeopathic College	(1912)	Michigan
Eclectic Medical Institute, Cincinnati	(1909)	Arkansas
University of Pennsylvania	(1909)	Penna.
University of Pittsburgh	(1911)	Michigan
Western University of Pennsylvania	(1901)	Penna.
Jefferson Medical College	(1908)	Penna.

LICENSED THROUGH RECIPROCITY JULY 1, 1913

College	Year Grad.	Reciprocity with
Georgetown University	(1911)	Dist. Colum.
Indiana Medical College	(1906)	Indiana
Baltimore Medical College	(1902)	W. Virginia
College of Physicians and Surgeons, Baltimore	(1911)	Maryland
University of Maryland	(1904)	Maryland
Maryland Medical College	(1903)	Penna.
University of Michigan, Department of Medicine and Surgery (1903) (1910)	(1912)	Michigan
Barnes Medical College	(1904)	Missouri
Cleveland Homeopathic Medical College	(1904)	Penna.
Jefferson Medical College	(1912)	Penna.
University of Pennsylvania	(1912)	Penna.
Jefferson Medical College (1912) Penna.;	(1912)	New Jersey
Medico-Chirurgical College of Philadelphia	(1909)	Penna.

Delaware June Report

Dr. Henry W. Briggs, secretary of the Medical Council of Delaware, reports the written examination held at Dover, Delaware, June 17-19, 1913. The number of subjects examined in was 10; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 6, all of whom passed. Four candidates were licensed through reciprocity. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
Jefferson Medical College (1912) 85.4, 91.5;	(1913)	81.8, 82.3, 83.7.
University of Pennsylvania	(1913)	80.7

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
University of Maryland	(1911)	District of Columbia
University of Pennsylvania (1900) Maryland	(1910)	Penn.
Hahnemann Medical College of Philadelphia	(1883)	Penn.

Kentucky June Report

Dr. J. N. McCormack, secretary of the Kentucky State Board of Health, reports the written examination, held at Louisville, June 3-5, 1913. The number of subjects examined in was 15; percentage required to pass, 70, and not less than 60 in any one branch. The total number of candidates examined was 62 of whom 54 passed, including 3 osteopaths, and 8 failed. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
Chicago College of Medicine and Surgery	(1913)	89
Hering Medical College (1912) 86;	(1913)	87, 89
University of Louisville (1910) 72; (1912) 75, 77;	(1913)	70, 76, 77, 79, 79, 79, 80, 80, 80, 81, 82, 83, 83, 83, 83, 84, 84, 84, 85, 85, 85, 85, 85, 86, 86, 86, 86, 86, 87, 87, 87, 88, 89, 91
Johns Hopkins University (1911) 88; (1912) 85;	(1913)	84, 86
Ohio-Miami Medical College	(1913)	87
Meharry Medical College	(1913)	77
Vanderbilt University (1912) 83;	(1913)	82, 84, 85

FAILED

College	Year Grad.	Per Cent.
Bennett Medical College	(1913)	57
University of Louisville (1909) 42; (1911) 55;	(1912)	66
Louisville National Medical College	(1912)	53, 61, 61
Meharry Medical College	(1913)	70

Minnesota June Report

Dr. Thomas McDavitt, secretary of the Minnesota State Board of Medical Examiners, reports the written, oral and practical examination held at the State University, Minneapolis, June 3-6, 1913. The number of subjects examined in was 11; total number of questions asked, 80; percentage required to pass, 75. The total number of candidates examined was 52, of whom 51 passed and 1 failed. Eight candidates were licensed through reciprocity. The following colleges were represented.

PASSED

College	Year Grad.	Per Cent.
Northwestern University Medical School	(1912)	83.1
Rush Medical College, Chicago	(1913)	83.9
University of Louisville	(1909)	83.1
Harvard Medical School	(1905)	89.1
University of Minnesota (1912) 87.5;	(1913)	81.1, 81.6, 83.1, 84.2, 84.5, 84.6, 85.1, 85.1, 85.2, 85.3, 85.3, 85.7, 86.1, 86.1, 86.2, 86.3, 86.3, 86.3, 86.4, 86.4, 86.9, 86.9, 87, 87.3, 87.5, 87.5, 87.9, 88, 88.4, 88.8, 88.8, 88.8, 89.4, 89.6, 89.8, 90, 91.2, 91.5, 91.9, 92, 93.3.
Barnes Medical College	(1909)	82.8
University of Paris	(1894)	75.9
University of Toronto, Ontario	(1909)	84
University of Christiania, Norway	(1912)	77
University of Edinburgh, Scotland	(1910)	86.9

FAILED

College	Year Grad.	Per Cent.
Meharry Medical College	(1912)	70 2

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
University of Illinois	(1911)	Illinois
Chicago College of Medicine and Surgery	(1912)	Illinois
Northwestern University Medical School	(1910)	Illinois
Detroit College of Medicine	(1912)	Michigan
University of Michigan, College of Medicine and Surgery	(1911)	Michigan
University of Minnesota, College of Medicine and Surgery	(1911)	N. Dakota
Marion-Sims College of Medicine	(1898)	Illinois
University of Copenhagen	(1888)	Iowa

Connecticut July Report

Dr. Charles A. Tuttle, secretary of the Connecticut Medical Examining Board, reports the written and practical examination, held at New Haven, July 8-9, 1913. The number of subjects examined in was 7; total number of questions asked, 70; percentage required to pass, 75. The total number of candidates examined was 42, of whom 22 passed and 20 failed. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
Yale Medical School (1907) 76.5; (1908) 77.9; (1912) 84, 87.5;	(1913)	79.5, 85.8
College of Physicians and Surgeons, Baltimore	(1913)	80.2, 82.8
Johns Hopkins University	(1913)	87.9
Maryland Medical College	(1913)	75.6
" " School (1909) 85.3;	(1912)	81.5
" School	(1913)	80.5
Columbia University, College of Physicians and Surgeons, New York (1883) 84.9; (1895) 79.1	(1913)	82.5
University and Bellevue Hospital Medical College	(1913)	84.8
Long Island College Hospital, New York	(1912)	86
Jefferson Medical College	(1913)	78.9, 79.1
University of Vermont	(1913)	77.1, 81.8

FAILED

Yale Medical School	(1913)	72.9
Howard University, D. C.	(1912)	73.9
Georgetown University, D. C.	(1912)	70.9
University of Louisville	(1912)	55.9, 71.2
University of Maryland	(1912)	68.1, 68.7
Baltimore Medical College	(1909)	66.8
College of Physicians and Surgeons, Baltimore (1911) 65.2;	(1912)	67.1
Maryland Medical College (1910) 57.5; (1911) 63.2; (1912) 56.9, 60.2; (1913) 44.6, 60.2, 63.7, 67.5		
University of Vermont (1912) 67.9;	(1913)	73.2

Book Notices

EINFÜHRUNG IN DIE HÖHERE MATHEMATIK FÜR NATURFORSCHER UND AERZTE. Von Dr. J. Salpeter. Price, 12 marks. Paper. Pp. 336 with 147 illustrations. Jena: Gustav Fischer, 1913.

This work is essentially a text-book for beginners in the differential and integral calculus. It differs from the current text-books of that subject intended for students of mathematics chiefly in the greater number of applications of the mathematical results to problems of physics, chemistry and allied sciences. In this respect it is decidedly an interesting work. During the past few decades a marked tendency has been generally noticeable on the part of writers in this field to seek to enhance the interest of the abstract theory by illustrative examples showing how the theory can be applied under diverse concrete conditions. The great obstacle in the way has been the fact that such illustrations are really illuminating only to one who is well acquainted with the field in which the application is made, and that there exists only a limited number of concrete situations in natural sciences which are so simple that they can readily be made intelligible to the average reader who has no technical knowledge of the sciences in question, and which at the same time lead to mathematical formulations sufficiently complex to constitute effective illustrations for the various divisions of so extensive a subject as the calculus. Salpeter has succeeded in getting together possibly an unprecedentedly large number of such illustrations, and for this reason his work will prove interesting and helpful to those who have already made some study of the calculus, as well as to beginners. However, it is quite possible that the beginner might find himself distracted rather than helped in his first study of the basic principles of the calculus by an attempt to form an image of so large a number of concrete and more or less unfamiliar physical situations. To the physician, in the most restricted sense of the word, the book brings no message; its appeal is rather to him as physicist, physiologist, chemist or man of general culture.

SKIN-GRAFTING FOR SURGEONS AND GENERAL PRACTITIONERS. By Leonard Freeman, B.S., M.A., M.D., Professor of Surgery in the Medical Department of the University of Colorado. Cloth. Price, $1.50. Pp. 139, with 24 illustrations. St. Louis: C. V. Mosby Company, 1912.

This little monograph presents in a concise manner the general subject of skin-grafting. The various methods of grafting, the advantages and disadvantages of each, and the particular conditions under which each is most applicable, are well outlined. The grafting of animal membranes of various kinds to the human body is described and the results thus far obtained detailed. Experiments as well as practical experience show unmistakably the advantages of autografts over all other methods. It is an instructive and interesting little volume.

MALINGERING AND FEIGNED SICKNESS. By Sir John Collie, M.D., J.P., Medical Examiner, London County Council. Assisted by Arthur H. Spicer, M.B., B.S., D.P.H. Cloth. Price, $3 net. Pp. 340, with 44 illustrations. New York: Longmans, Green & Co., 1913.

Malingering is a condition that many physicians in their daily practice fail to take into consideration. Even those who frequently come in contact with cases of injury due to accident for which compensation or indemnity may be claimed often fail entirely to recognize malingering, even when it is present in some of its most common forms. Since workmen's compensation acts and accident indemnity insurance are becoming more common, it is necessary for physicians to pay more attention to this subject in order that justice may be done both parties. There are many forms of malingering and some of those practicing it are very clever, so that it takes an exceedingly keen diagnostician to detect the fraud. This little volume is not only timely, but it is also interestingly written. The author has had an unusually large experience in this line of work and exhibits a shrewdness in making deductions which shows great familiarity with the arts of the malingerer and deep insight into human nature. There is not only conscious malingering which is actually dishonest and malicious, but there is also unconscious malingering by honest persons. The physician should be able to recognize all forms wherever and whenever found. This book will be of great help to the physician who is called on to detect such cases.

ORGANIC AND FUNCTIONAL NERVOUS DISEASES. A Text-Book of Neurology. By M. Allen Starr, M.D., Ph.D., L.L.D., Professor of Neurology, College of Physicians and Surgeons, New York. Fourth Edition. Cloth. Price, $6 net. Pp. 970 with 353 illustrations. Philadelphia: Lea & Febiger, 1913.

In Starr's standard text-book on nervous diseases the general practitioner almost always finds the desired information stated in a few terse paragraphs, while in some other works he may have to wade through irrelevant material before reaching a rather indefinite statement. The great secret of Starr's success is his direct and dogmatic style; in reading a page in his book one almost imagines that the author is lecturing to the reader. While no radical changes can be discovered in this the fourth edition of the work, yet here and there improvements are noted. Especially commendable is the author's attitude toward the discussion of the theories of the neuroses and psychoneuroses. For instance, though no disciple of Freud's views, he does not disdain to at least state them and make personal comment. Among many other valuable articles under the functional diseases, the one on psychasthenia is a masterpiece of condensation. The criticism made in a previous review that the author had become so fond of the organic nervous diseases that the functional disturbances were somewhat meagerly treated by him, must now be withdrawn. In this edition even the functional nervous diseases have received adequate consideration.

DIE LEBERKRANKHEITEN. Für Studierende und Aerzte. Von Dr. C. A. Ewald, Gen. Med. Rat, Professor ord. hon. an der Kgl. Friedrich-Wilhelm-Universität. Paper. Price, 10 marks. Pp. 275, with 44 illustrations. Leipsic: Georg Thieme, 1913.

This monograph is a little fuller than many of the text-book articles on diseases of the liver. It embodies the results of Ewald's forty years of experience as a physician, twenty-five of which have been passed at the Augusta Hospital in Berlin. It is this clinical experience that constitutes the best feature of the book. Many of the illustrations are from material from Ewald's own cases and are good. The discussion of questions of physiology and pathology can hardly be called very thorough, nor is there evidence of that exhaustive search of the literature that one might expect in a monograph of this kind. While the book is to be commended it is hardly of the same grade of excellence as the same author's earlier work on diseases of the stomach. Perhaps this is due to the fact that that work contained more of original observation. The subject also had at that time the charm of freshness and the author more of the vigor and positiveness of young manhood.

TREATMENT AFTER OPERATION. By William Turner, M.S., F.R.C.S., Senior Surgeon to the "Dreadnought" Seamen's Hospital, Greenwich, and E. Rock Carling, B.S., F.R.C.S., Surgeon to the "Dreadnought" Seamen's Hospital, Greenwich. With a Chapter on the Eye by L. V. Cargill, F.R.C.S., Senior Ophthalmic Surgeon, King's College Hospital. London Medical Publications. Cloth. Price, $3.75. Pp. 247, with 55 illustrations. New York: Oxford University Press, 1912.

This manual is intended by the authors to furnish practitioners, house surgeons, senior nurses and students with a guide for the after-treatment of operative cases. It is eminently practical; there is no waste of words, the text being a direct statement of the means found satisfactory in the practice of the authors. Many useful formulas are given, and all directions and descriptions are *explicit*. The authors are conservative as to the length of time to be *spent in bed* by patients who have undergone section of the abdominal wall, and advocate a longer period than is *generally considered* necessary in this country; but, if this be an error, it is on the safe side. The value of the work is *considerably* enhanced by the inclusion of a section devoted to the care of patients after *operations on the eye. This is written by* Cargill and is thoroughly modern and complete. Altogether we should say that *the authors have succeeded in producing* a book exceedingly useful to those for whom it was specially written, and *also well worth perusal by the surgeon.*

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Insanity, Baltimore

July, LXX, No. 1, pp. 1-279

1 Dissimilar Heredity in Mental Disease. A. J. Rosanoff, Kings Park, N. Y.
2 *Stastistic Studies in Syphilis with Wassermann Reaction and General Paralysis. F. S. Hammond, Trenton, N. J.
3 *Insanity and Race. H. M. Swift, Portland, Maine.
4 *Blood in Pellagra.* J. C. Bardin, Petersburg, Va.
5 *Prison Psychosis. A Pseudonym?* P. E. Bowers, Michigan City, Ind.
6 Pathologic Histology of Cortex in Psychoses. A. Alzheimer, Breslau.

2. Syphilis and Wassermann Reaction.—The entire population of the New Jersey State Hospital at Trenton, which is *representative of the rural type of general population of the* state, was examined by Hammond by means of the Wassermann syphilis reaction, in all 1,583 individuals being tested. Seventy of these were cases of general paralysis, and 1,513 were cases otherwise diagnosed. Of the cases not general paralysis, 1,472 reacted negatively and forty-one positively, *on which basis* there is a percentage of 2.7 latent lues in the total hospital population not paresis. Including cases of *general paralysis* about 7 per cent. of all individuals of both sexes examined, and about 10 per cent. of all males were found to be *infected with syphilis* as judged by the serum reaction.

These relatively *low figures*, as *compared* with those of some previous more *limited investigations* in institutions, Hammond believes are solely and wholly *accounted* for by the type of general population and rural environment from which the individuals examined originally came, and further, that in the difference of environment is found the explanation for the discrepancies in results among these previous investigations themselves. Hammond believes, furthermore, that this investigation, both in itself and by comparison with some of the more reliable previous figures, shows that the relative prevalence of syphilis in city and country is in general exactly two to one. A careful analysis of all data, including age, sex, color, nationality, civil condition and type of psychosis leads to the conclusion that syphilis among the insane is no more frequent in occurrence and differs in no particular in its distribution from that found in any general community; that in fact investigations as to the frequency of syphilis among the insane offers the most convenient method of accurately determining the figures for any corresponding general population, and it is for this reason that Hammond believes that the prevalence of lues in the entire general adult population of the state of New Jersey is 7 per cent.

Only one type of psychosis other than general paralysis (and cerebral lues) has been found to be definitely related to syphilis as cause and effect in either direction. This is the type of focal brain disorder which occurs in middle life as a result of vascular sclerosis. This group was found to constitute 16 per cent. of all the arteriosclerotic mental disorders among men and which, although not symptomatically differentiated from other similar focal brain diseases, has an entirely different etiology which may be demonstrated by biologic methods. In the field of general paralysis comparison of biologic, cytologic and chemical findings has pointed out that not only are the processes thus indicated usually found in association, but that there is at least as much evidence for the belief that all are dependent on one and the same mechanism, viz., the inflammatory process of the central organ, as for the conclusion reached by others that each is separate and independent. Hammond's experience in this series with the original Wassermann technic and that of the Noguchi modification has shown that with alcoholic extract antigen the Wassermann test gave a 5 per cent. error of deficiency, and the Noguchi test a 2 per cent. error of excess, and that reliable results are only to be obtained by the use of both methods in combination.

3. Insanity and Race.—Swift summarizes his study by *stating that insanity occurs with relatively greater frequency* among the population of foreign birth and parentage than among native stock, and from this last it *may be inferred* that, associated with the three great causes of insanity, heredity, alcohol and syphilis, there is operative in *America another* potent factor in thé overfilling of our public asylums, *namely*, immigration.

Annals of Surgery, Philadelphia

August, LVIII, No. 2, pp. 145-288

7 *Surgery of Pancreas. W. J. Mayo, Rochester, Minn.
8 *Pancreatic and Peripancreatic Lymphangitis. J. B. Deaver* and D. B. Pfeiffer, Philadelphia.
9 *Laryngectomy for Cancer. G. W. Crile, Cleveland.
10 Excision of Both Lobes of Thyroid for Cure of Exophthalmic Goiter. W. S. *Halsted*, Baltimore.
11 *Partial Occlusion of Thoracic and Abdominal Aortas by Bands of Fresh Aorta and of Fascia Lata. W. S. Halsted, Baltimore.
12 *Surgery of Pulmonary Artery. W. Meyer, New York.
13 Sarcoma of Chest Wall. F. B. Lund, Boston.
14 Acute Perforating Sigmoiditis in Children: Report of Two Cases. J. Ransohoff, Cincinnati.
15 Excision of Infarct in Acute Hematogenous Infections of Kidney. L. W. Hotchkiss, New York.
16 Technic of Nephrolithotomy, Pyelolithotomy and Ureterolithotomy. J. H. Gibbon, Philadelphia.
17 Rupture of Bladder: Report of Tthree Cases. G. Woolsey, New York.
18 Sarcoma of Stomach. C. L. Scudder, Boston.
19 Surgical Aspects of Purpura. J. F. Mitchell, Washington, D. C.
20 Aneurysm of *Internal Iliac*. A. MacLaren, *St. Paul*, Minn.

7. Surgery of Pancreas.—In 448 resections of the stomach for benign and malignant diseases up to Dec. 31, 1912 (W. J. and C. H. Mayo) the average mortality was 10 per cent. In about 8 per cent. of these cases the pancreas was injured and the average mortality was 11 per cent. In none of these operations, however, was the main pancreatic duct reached, usually only a superficial piece was removed from the surface at a point where the pancreas was adherent to the diseased stomach. The bleeding was usually free and best controlled by catgut on a curved needle. It was noted that in these cases the pancreas had a fibrous capsule, the result of the localized peritonitis.

In thirty-one splenectomies performed in the Mayos' clinic the tail of the pancreas was injured three times, owing to the fact that the tail passes with the splenic vessels well up into the hilum of the spleen. In one case half the pancreas was resected for tumor. The patient made a good recovery, and remains well. The tumor which had the external characteristics of a malignant growth, proved on section to be a benign thick-walled trabeculated cyst buried in sclerosed pancreatic tissue.

9. Laryngectomy for Cancer.—In Crile's twenty-seven laryngectomies there were two deaths, and these two were apparently the most promising cases of all. The prognosis in these cases seemed so favorable that he ventured to discard the full preliminary preparations. In one case he made no preliminary protective operation of any kind, and the patient died at the end of five weeks with mediastinal abscess. In the other case he made a preliminary gauze packing in the neck around the trachea, but did not perform a preliminary tracheotomy. In this case he brought the isolated upper end of the trachea forward to the skin and anchored it. The entire isolated portion necrosed, as did also a portion of the trachea beyond the isolated part. As a result pus was inhaled into the respiratory tract below the level of the sternum. The necropsy showed no pneumonia and no mediastinitis, but a septic tracheitis and bronchitis. Death was the result of local absorption, and of absorption from the trachea and from the bronchial mucosa.

This case demonstrated most conclusively the efficiency of the granulation barrier which is created by a preliminary iodoform packing. Crile is convinced that had he made a preliminary tracheotomy, or had he allowed the trachea to remain in its bed, the patient would surely have recovered.

In sixteen of these twenty-seven laryngectomies for cancer the laryngeal box was so choked with the growth that tracheotomy was required to prevent suffocation. Most of the patients gave a long history of hoarseness followed by gradual, though intermittent, obstruction to respiration. In two cases there was associated lues. One of these last two cases illustrates well the clinical difficulty of diagnosis. The lesion was first diagnosed correctly as luetic, and under a course of treatment the greater part of the growth disappeared. The residual growth, however, showed a progressive tendency, and was later diagnosed as cancer. Laryngectomy was performed and the patient is now alive and well, more than three years since his operation. The special lesson of this case is that cancer of the larynx, like cancer of the tongue, may follow local luetic lesions. There is danger, therefore, that the hope of a luetic cure may defer too long the laryngectomy which is the only chance for the cure of the cancer. As the lymphatics are involved in extrinsic cancer, a much wider dissection is required. Operation in cases of extrinsic cancer is but a palliative remedy, but even in such cases total laryngectomy is advised, because local recurrence comes more surely and more quickly if one cuts into the growth.

11. Partial Occlusion of Aorta by Fresh Tissue.—April 29, 1912, Halsted operated on two dogs, partially occluding the aorta of one of them with a spiral aortic band and of the other with a cuff cut from the same vessel. Strips of aorta were employed rather than of fascia lata, for example, because he hoped that the elastic tissue, in case it did not endure, might at least serve its purpose for a time sufficient to cure an aneurysm. At the end of two months one of the dogs was killed and the cuff which had been used in this experiment was apparently organized and had not stretched to any appreciable extent. Above the cuff the aortic pulse was forcible, but below the constriction it was very feeble, though countable and accompanied by a thrill. The other dog operated on at the same time and in the same manner, except that a spiral band of aorta instead of a cuff had been employed, died (cause of death unascertained) about three weeks after the operation. In this instance the aorta had been almost completely occluded by the spiral aortic strip. The welt-like band had not stretched and seemed to be organized. The aorta, on being split longitudinally, was seen to be greatly wrinkled and almost occluded at the site of the band. Sections of the specimens indicated that the elastic coats of the bands as well as of the included artery were intact.

During the winter of 1912-13 Halsted made about twenty-five similar experiments with encouraging results. He has learned, however, that whereas the spiral bands seem to be perfectly safe there is danger in the employment of the cuffs. In two instances of twelve or more experiments, one of the mattress sutures taken to hold the flaps of the cuffs together cut part way through the cuffs and thus, being brought in contact with the aortic wall, wore a minute hole in the vessel, through which the animal bled to death. Such an accident can hardly happen with the employment of the spiral strip, for not only is the strain on the stitches very slight when this form of band is used, but even if it were so great that a thread might cut through the spiral at any point, it could hardly be brought to bear on the aorta in such way as to wear into its wall. To each end of the band of fresh tissue a narrow tape is sewed to facilitate the manipulation of the transplant, which is wound twice about the aorta. When one or two stitches have been taken at one end to hold the contiguous edges of the spiral together at this point, the other end of the strip is pulled on until the aorta is occluded to a little more than the desired amount, and then two additional stitches are taken to maintain the constriction.

Within the past few weeks Halsted has examined the bands of aorta, fascia lata and chromicized submucosa which had been wound about the aorta last autumn and winter. In two instances in which considerable constriction of the aorta had been made about four months previously, kymographic tracings of the blood-pressure in the femoral and carotid arteries were made. There was no diminution in the femoral pressure, and on investigating the band it was found in each instance to have relaxed and to have been partially absorbed. In dogs operated on as long as seven months ago there was a considerable absorption of the band; and in one instance only a trace of it remained. One spiral band which had been applied so as to make almost total occlusion seven months before seemed microscopically to be well preserved, but it no longer restricted the aorta, the lumen of which was completely restored, and whose underlying wall was apparently normal.

12, 13.—Abstracted in THE JOURNAL, June 21, pp. 2024 and 2025.

Boston Medical and Surgical Journal

August 14, CLIX, No. 7, pp. 221-260

21 Sphincteric Atrophy: Causes, Consequences and Treatment. R. W. Jackson, Fall River, Mass.
22 *Rôle of "Family Clusters" in the Prevalence of Pulmonary Tuberculosis. C. C. Maccorison and N. B. Burns, Reading.
23 *Diagnosis of Typhoid on Admission to a Hospital. G. C. Shattuck and C. H. Lawrence, Boston.
24 Experimental Scorbutus and the Roentgen-Ray Diagnosis of Scorbutus. F. B. Talbot, W. J. Dodd and H. Peterson.

22. "Family Clusters" in the Prevalence of Pulmonary Tuberculosis.—In reviewing the records of 1,300 admissions to the North Reading State Sanitarium in the three and a half years of this institution's existence the authors found therein an interesting study in data relating to the pedigrees of certain cases. They learned that in 134 distinct examples there occurred the incidence of at least three cases of pulmonary tuberculosis in a single family. These groups of infected people they have designated as "family clusters." A study of these family groups leads them to believe that the domiciliary distribution of tuberculosis may be due wholly or in part to the establishment of foci of infection following carelessness of individuals, usually adult open cases with the disease. The swiftest channels for spread of disease and for furtherance of its activity is through the family lines. They do not propose positive remedies for the eradication of the family cluster evil because it lies too much enmeshed with other social misfortunes to offer one opportunity to isolate and exterminate easily the trouble.

At the sanatorium, in the matter of preventive tactics, they come to the point of contact with the family cluster evil in this way: A far-advanced consumptive, incurable and hopelessly ill, beseeches his family to take him home. The family, overcome with sympathy and fraternal pity, is inclined to accede to the patient's wishes, even though there are only scant means with which to care for him properly at home, and what is most important, no safe place to house him in such a way as to preclude danger of contaminating the several young children of the family. If the family is patiently remonstrated with, and if they can be impressed with the full significance of the family cluster danger, some success may be met with in preventing a further extension of phthisis in their midst.

23. Diagnosis of Typhoid on Admission to Hospital.—Shattuck and Lawrence urge that typhoid should be suspected until some other diagnosis seems reasonably certain. Mean while, these patients should be treated under precautions to prevent the possible spread of infection. If this be done, it is possible to avoid risk of spreading infection in nearly all instances. In their series of 100 non-typhoid patients of fourteen years of age or older in which typhoid was suspected, bronchitis, broncho-pneumonia and influenza represent 29 per cent., or nearly one-third of the whole, undiagnosed fevers 15 per cent. and gastro-enteritis, diarrhea and colitis 12 per cent. Absence of rose-spots at the first examination has little weight for diagnosis. The same is true of splenic enlargement when not demonstrable by palpation, and of the Widal test when negative.

A positive Widal test is regarded as of the greatest importance. Typical rose-spots are very important and a palpable spleen is a valuable indication of typhoid, but is common in various conditions simulating typhoid. Atypical rose-spots are valueless for diagnosis. Absence of leukocytosis in a febrile disease strongly suggests typhoid. A white-count below 5,000 is a valuable indication of typhoid fever, and is unusual in conditions simulating typhoid. A white-count above 9,000 is presumptive evidence against typhoid. Bronchitis has no weight *per se* either for or against the diagnosis of typhoid fever. Ordinary bronchitis patients, as a rule, entered the hospital during the first week, and typhoid with signs of bronchitis generally during the second week of illness. Congestion of the bases of the lungs, when present in febrile disease uncomplicated by cardiac insufficiency, points to typhoid. The temperature in typhoid is seldom below 101 F., whereas in other conditions simulating typhoid the temperature is commonly below 101 F. In typhoid, the pulse-rate is more apt to be low in proportion to the temperature than in other diseases.

Bulletin of American Academy of Medicine, Easton, Pa.

August, XII, No. 4, pp. 246-328

25 Physician of the Future. R. L. Wilbur, San Francisco.
26 Exclusion of Immigrants Affected with Diseases of Skin. L. D. Bulkley, New York.

Journal of Experimental Medicine, New York

August, XVIII, No. 2, pp. 113-217

27 *Studies on Circulation in Man: Blood Flow in Hands (Mainly) in Cases of Anemia. G. N. Stewart, Cleveland.
28 *Intestinal Obstruction. J. A. Hartwell, New York.
29 Experimental Study of Late Kidney (Glomerular) Lesions Caused by Crotalus Venom. R. M. Pearce, Philadelphia.
30 *Visceral Organisms. A. Carrel, New York.
31 Cerebrospinal Fluid in Syphilis. A. W. M. Ellis and H. F. Swift, New York.
32 Growth of Tissue in Acid Media. P. Rous, New York.
33 Selective Bactericidal Action of Methylene Blue. J. W. Churchman, New Haven.
34 *Relation of Rate of Absorption of Epinephrin to Its Glycosuric and Diuretic Effects. I. S. Kleiner and S. J. Meltzer, New York.
35 Relation between Proteid Cleavage Products and Anaphylaxis. J. Auer and D. D. Van Slyke, New York.

27. **Circulation in Man.**—In the cases of anemia studied (pernicious anemia, chlorosis and secondary anemia) the blood-flow in the hand is smaller than the normal flow. Accepting Plesch's result, that the minute volume of the heart is increased in the anemias, the diminution in the hand flow is interpreted as a sign of a vasoconstriction in peripheral parts, which facilitates the increased flow through the lungs. The deficiency in the hand flow is less in the chlorotic group than in the other cases of anemia. The explanation suggested is that the increased total volume of the blood in chlorosis permits the normal amount of hemoglobin to circulate through the lungs without a marked increase in the peripheral vasoconstriction. The view that the diminution in the cutaneous blood-flow in anemia is a necessary compensatory arrangement for increasing the flow through the lungs affords a natural explanation of the beneficial effect in many cutaneous disorders of general measures, especially those aimed at improving the quality of the blood. In a case of bradycardia with a pulse rate permanently below 40 during rest in a sitting position, the hand flow was normal.

28. **Intestinal Obstruction.**—Hartwell claims that the length of life is in inverse ratio to the damage occurring in the intestine. All the animals in his experiments were under practically identical conditions as far as the stagnation of the intestinal contents is concerned, and if the poison arose from this source, or from functional changes in the mucosa, he claims they should have lived approximately the same time. A simple explanation is offered for the varying damage to the intestine. When antiperistalsis is sufficient to empty the intestine toward the stomach, no damage results. When this is absent the accumulated secretions distend the bowel until the circulation is obstructed and the damage results. The administration of saline subcutaneously exerts no influence either on the production of the poison under this condition, its absorption, or its elimination, and the dogs sicken and die in spite of this treatment. He cites examples to show that in the absence of damage to the intestine no symptoms of poisoning arise, provided the water lost by vomiting is replaced, and in the presence of such damage no amount of saline will, to an appreciable extent, affect the development of poisoning, or prevent death.

To Hartwell the conclusion seems inevitable that the only poison present in intestinal obstruction arises from the damage secondary to the obstruction, and not from the stagnation of intestinal contents or an altered function of a normally appearing mucosa. As final proof of his position, he reports that by exercising great care in avoiding damage to the intestinal wall, it is possible to keep dogs with the closed loop alive for comparatively long periods. He sounds a note of warning, viz., that the application of these facts to intestinal obstruction in man must be made with reserve. The human intestine is apparently incapable of withstanding the same amount of distention without damage, and consequently a poisoned condition occurs earlier in man. However, there are two important results of this experimental work. The need of large amounts of saline subcutaneously is proved, and has been used by Hartwell with advantage, patients having readily absorbed three to six quarts in twenty-four hours. He says there is no necessity of draining out the intestinal contents unless the bowel is damaged. Simple stagnation does not yield a poisonous substance, and consequently the release of the obstruction by operation is sufficient. When, however, strangulation has begun, the material above the obstruction should be removed, and if extensive damage exists a continued drainage through an enterostomy may be needed.

30. **Visceral Organisms.**—Since June, 1912, Carrel has been working to develop a technic by means of which a system of organs could be made to live and functionate when separated from the other organs. The present method consists in removing aseptically the abdominal and thoracic organs of an animal and in preserving the organs in an incubator at a temperature of 38 C., while the lungs are being artificially ventilated. The thorax and abdominal viscera, united by their blood-vessels, were removed from the cadaver of the animal and placed in a tray containing Ringer's solution at a temperature of about 38 C., in such a manner that the lungs floated on the surface of the fluid and the heart was suspended underneath in the liquid. When this position was reversed and the heart was placed above the lungs the circulation was somewhat impaired. The temperature of the Ringer's solution was maintained constant by means of an electric pad placed under the tray, or simply by the addition from time to time of Ringer solution at the right temperature. Ordinarily the heart still pulsated slowly and regularly, but the blood-pressure was low and the appearance of the organs anemic.

After a few minutes the blood-pressure began to rise, and in a few cases became almost normal. Generally it remained low and sometimes the heart entirely ceased beating. Then a transfusion was made from the carotid artery of the first animal to the inferior vena cava or abdominal aorta of the visceral organism. When the pressure was very low or when the pulsations of the heart had completely stopped, the transfusion was made directly through the aorta, in order to reestablish immediately a normal circulation through the coronary arteries. The heart started almost immediately to pulsate normally. As the condition of the heart improved the transfusion was made through the inferior vena cava. It was possible in that way to inject quickly a large quantity of blood into the visceral organism. Immediately after the transfusion the lungs became pink, the heart beat strongly from 120 to 150 times a minute, and the blood-pressure often rose above normal. The abdominal aorta pulsated violently and strong pulsations could be seen in the arteries of the stomach, liver, kidney, intestine and even of the ovaries. Peristaltic contractions of the stomach and of the intestines were observed. The spleen, which was bluish, assumed its normal appearance. After a few minutes all the viscera were apparently normal.

Then a careful hemostasis of the posterior branches of the thoracic aorta was made and all the forceps were removed. It was important to ascertain that no hemorrhage, even one from a very small vessel, was taking place. If a few minutes after the transfusion the pressure was still above normal, a certain quantity of blood was allowed to flow from the lower part of the abdominal aorta. Then the appearance of the viscera exactly resembled that of a normal animal. The visceral organism was placed in a tin box filled with Ringer solution, and covered with Japanese silk and protected by a glass cover. The tracheal and esophageal tubes were fastened to proper openings in the anterior part of the box. The intestine was pulled through a glass and rubber tube fixed in the posterior wall of the box. The end of the intestine was fixed by circular suture to the edge of the rubber tube, an artificial anus being made. The box was put into an incubator at a constant temperature of about 38 C. Artificial respiration was carried on by a current of air interrupted about twelve times a minute. The compressed air was furnished by means of an automatic electric apparatus pumping air into a tank, from which it was given to the animal under the proper pressure. Water or food could be injected into the stomach through the esophageal tube. The urine could be collected from the bladder through a tube, but it was generally aspirated from the bladder with a needle, when samples of urine were taken for study. The feces and intestinal secretions were received outside of the box from the artificial anus.

It was then observed that during the hours following the operation the viscera had the same appearance as those of a living animal. The contractions of the heart and the circulation of the organs were apparently normal. Pulsations could be seen in the smaller branches of the mesenteric artery. The intestine emptied itself through the artificial anus by means of regular peristaltic contractions. When the intestine was empty, bile and intestinal juices were evacuated. In an experiment in which the stomach was full of meat at the time of death, digestion took place. At least 90 per cent. of the amino-acids injected into the intestine were rapidly absorbed. There was also an abundant secretion of urine, which was collected into the bladder. After five or six hours hyperemia of the peritoneum of the intestine appeared. It seemed as though a peritonitis developed progressively, and in some cases the intestines became paralyzed after eight or nine hours, although their circulation was still very active. Abundant hemorrhage could still be produced by section of a small branch of the mesenteric artery.

Some of the visceral organisms died almost suddenly after three or four hours, but most of them were in a normal condition ten and even twelve hours after the death of the animal to which the organs belonged. The death of the organism was announced by some irregularities in the pulsation of the heart, which was also weaker. Then the heart stopped suddenly. In one experiment the death of the visceral organism occurred thirteen and one quarter hours after the death of the cat from which it was taken.

34. **Rate of Absorption of Epinephrin.**—Kleiner and Meltzer found that subcutaneous injections of epinephrin are, in contrast with its behavior in the production of the other effects of that drug, more favorable to the production of glycosuria in rabbits than intramuscular injections: the failures are fewer and the quantities of dextrose in the urine are generally larger. In general, as regards the stimulation of diuresis by epinephrin, a subcutaneous injection exerts generally a greater effect than an intramuscular one. Subcutaneous injections of a certain dose of epinephrin distributed over several areas are far less effective than the administration of that dose in a single injection; they fail frequently to produce any glycosuria, the quantity of dextrose in the urine, when present, being less, and the quantity of urine being generally diminished. Apparently, the more slowly the injected epinephrin reaches the blood, the greater is its effect in producing glycosuria and generally, also, the greater its diuretic action.

Journal of Ophthalmology and Oto-Laryngology, Chicago

July, VII, No. 7, pp. 205-238

36 Auto-Intoxication in Relation to Eye. H. L. Hiltgartner, Austin, Texas.
37 Attenuated Types of Suppurative Sphenoiditis in Relation to So-Called Postnasal Catarrh, to Headache with Mental Daze and to Asthma. W. E. Casselberry, Chicago.

Kentucky Medical Journal, Bowling Green

August 1, XI, No. 15, pp. 633-688

38 Heredity: Its Influence on Progeny. J. T. Dixon, Owensboro.
39 Prevention by Vaccination. A. A. Schultz, Owensboro.
40 Malpositions of Abdominal Viscera in Intestinal Stasis. D. Y. Keith, Louisville.
41 Summer Diarrhea. J. A. Kirk, Philpot.
42 Ascites. C. V. Hiestand, Merrimac.
43 Anthrax and Its Treatment. W. A. Ligon, Louisville.
44 Sanitation. C. Pope, Louisville.
45 Medical Witness. J. Breathitt, Hopkinsville.
46 Septic Infections. S. M. Hopkins, Gardnersville.
47 Causes and Treatment of Summer Diarrhea. B. C. C. Turner, Lucas.
48 County Medical Society. U. L. Taylor, Columbia.
49 Tuberculosis. F. S. Tripp, Harrodsburg.
50 Physician Himself: Some Things He Is Blamed for and Some Things He Does. E. L. Gowdy, Campbellsville.
51 Case of Cerebrospinal Meningitis. A. O. Taylor, Maysville.
52 Menopause. T. L. Lamkin, Bardwell.
53 Exophthalmic Goiter. J. R. Wathen, Louisville.
54 Anterior Poliomyelitis. B. J. Bolin, Glensfork.
55 Urethral Strictures and Treatment. J. T. Windell, Louisville.
56 Surgical Treatment of Biliary Calculi. L. Frank, Louisville.
57 Capillary Bronchitis. J. G. Moss, Hartranft, Tenn.

Medical Record, New York

August 9, LXXXIV, No. 6, pp. 231-276

58 Problem of the Social Evil Considered in Its Social and Medical Aspects and in Its Relation to the Problem of Race Betterment. J. E. Mears, Philadelphia.
59 Infant Mortality. M. S. Reuben, New York.
60 Diagnosis of Gonorrheal Stomatitis. J. B. Stein, New York.
61 Indian Hospitals. C. B. Meding, New York.
62 Neosalvarsan. T. S. Van Riempst, New York.
63 Indicanuria, the Feces and the Sulphates of the Urine. J. C. Warbrick, Chicago.
64 Tuberculosis in the U. S. Navy. I. W. Brewer, Taughannock Fall, N. Y.
64 *Pneumonia, Immediate and Contributing Cause of Death; Rational Treatment. W. C. K. Berlin, Denver.

August 16, LXXXIV, No. 7, pp. 277-322

65 Surgery of the Revolutionary War. T. Abbe, Washington, D. C.
66 Wassermann Reaction in Cancer. F. J. Fox, New York.
67 Specifics in the Treatment of Tuberculosis. G. R. Pogue, Greeley, Colo.
68 Blunders Made by Nature. A. Maverick, San Antonio, Texas.
69 Dream Interpretation. J. W. Brandeis, New York.
70 Case of Broncholith, Bronchial Calculus or Lung Stone. W. F. Chappell, New York.
71 Positive Wassermann Reaction in Apparently Non-Syphilitic Cases. A. Newlin, Philadelphia.
72 Treatment and Pathology of Appendicitis. B. S. Purse, Savannah.
73 "Blackwater Fever." G. Richter, St. Louis.

64. **Treatment of Pneumonia.**—To an isotonic saline solution given intravenously Berlin has added iodin solution, to which were also added creosote and guaiacol for their anesthetic and germicidal action. The creosote acts strongly as a sedative to pain, relieves congestion, and greatly relieves dyspnea, making the patient more comfortable immediately. Although the number of patients so treated during the past two years has been too small to be conclusive, he says, that every patient has recovered in spite of the fact that several had been given an absolutely bad prognosis by competent consultants.

Michigan State Medical Society Journal, Grand Rapids

August, XII, No. 8, pp. 403-452

74 *Nature and Treatment of Bronchial Asthma. R. H. Babcock, Chicago.
75 School Hygiene or Health and Progress of School Child. F. Allport, Chicago.
76 Skin-Grafting. W. R. Parker, Detroit.
77 Ocular Manifestations of Disease of Hypophysis. G. M. Waldeck, Detroit.
78 Psychiatric Aspects of Sterilization Law. C. W. Mack, Pontiac.
79 Angina Pectoris; Case Report. E. Boise, Grand Rapids.

74. See The Journal, Aug. 2, Abstract No. 57, p. 365.

Military Surgeon, Washington, D. C.

July, XXXIII, No. 1, pp. 1-99

80 Campaign of Fredericksburg, December, 1862. L. C. Duncan, U. S. Army.
81 Cerebrospinal Meningitis: Report of Sixteen Cases Observed at Jefferson Barracks, Mo., 1911 to 1913. H. P. Pillsbury, U. S. Army.
82 Varioloid in Manila. P. M. Ashburn, E. B. Vedder and E. R. Gentry, U. S. Army.

New York Medical Journal

August 9, XCVIII, No. 6, pp. 257-304

83 *Dysentery in the Tropics. E. R. Whitmore, New York.
84 Acute Infectious Jaundice in Children. C. Herman, New York.
85 Retrocalcanean Bursitis. C. S. White, Washington, D. C.
86 Combined Cystoscope and Evacuator. E. MacD. Stanton, Schenectady.
87 Surgical Cure of Leprosy. E. S. Goodhue, Hawaii.
88 *Use of Very Minute Initial Dose in Tuberculin Therapy. M. Solis-Cohen, Philadelphia.
89 Acute Dilatation of the Stomach Complicating Pneumonia. E. H. Goodman, Philadelphia.
90 Chronic Intestinal Stasis. L. M. Kahn, New York.
91 Polycythemia: Report of a Case in an Insane Patient. R. M. Alexander, Wernersville, Pa.
92 Unilateral Septic Infection of the Kidney. A. P. Condon, Omaha, Neb.

August 16, XCVIII, No. 7, pp. 305-352

93 Prevention of Deafness. G. Hudson-Makuen, Philadelphia.
94 Importance of Serologic Analyses in Neurology. D. M. Kaplan, New York.
95 Safety Pin Removed from Larynx of Child by Direct Laryngoscopy. H. Smith, New York.
96 Etiology and Treatment of Hypertrichosis. P. E. Becht, New York.
97 Secretin as a Remedy in Gastro-Intestinal Disorders. H. R. Harrower, London, England.
98 Importance of Early Operation for the Radical Cure of Hernia. H. W. Austin, New York.
99 *Use of Phosphorus in Diseases of the Lungs. F. Lemon, Melbourne, Australia.
100 The Response of Veins to Epinephrin. A. C. Crawford and M. M. Twombly, Leland Stanford, Cal.
101 So-Called Latent Syphilitics or Paretics and Tabetics: A Water Suggestion. J. C. Minor, Hot Springs, Ark.
102 Typhoid from Uncooked Vegetables. C. Pixley, Missoula, Mont.

83. **Dysentery in the Tropics.**—Amebic dysentery, according to Whitmore, is endemic and does not ordinarily give rise to epidemics: bacillary dysentery gives rise to extensive epidemics. Amebic dysentery is due to a protozoon; bacillary dysentery is due to a bacillus. In amebic dysentery the process begins in the submucosa, from the specific tissue destroying property of the amebae which have traveled in through the mucosa; bacillary dysentery is a diphtheritic or croupous process, involving the intestinal mucosa, and the submucosa is only secondarily involved. Liver abscess is a frequent complication in amebic dysentery; it is very rare in bacillary dysentery. Amebic dysentery tends to become chronic, with amebic relapses: bacillary dysentery is a self-limited disease, with a tendency to complete recovery. Ipecac, in the form of emetine, is specific in amebic dysentery; a specific antitoxic and bactericidal serum gives the best results in the treatment of bacillary dysentery.

88. **Use of a Very Minute Dose of Tuberculin.**—With the exception of the method of White and Van Norman, Cohen says, there is no way of ascertaining beforehand the proper therapeutic dose of tuberculin for the individual patient, or the amount that will produce a reaction in that patient. Only by beginning tuberculin treatment with a dose smaller, or at least no larger, than the one that will benefit the patient, or produce a reaction, can one obtain the good effects and avoid the harmful action of this dangerous agent. In giving tuberculin, aim to begin with less than the amount required. In other words, give a safe dose. An initial dose larger than 0.000001 milligramme will probably produce a reaction of greater or less severity in the majority of tuberculous subjects. It can be given, therefore, only to a limited number of selected patients. The number of tuberculous patients who will exhibit a severe reaction to 0.0000001 milligramme of tuberculin is probably small. Hence, this is a safe dose for the average sufferer from tuberculosis, with the exception of advanced, toxic patients. As tuberculosis is usually a chronic disease, and its treatment prolonged, there can be no serious objection to taking a little time to determine the proper dose of tuberculin for the individual patient, especially if by so doing we avoid harming him. There is no immediate hurry. The proper method of giving tuberculin, therefore, would be to begin with 0.0000001 milligramme, or 0.00000001 milligramme, and if this dose should be found to be too small, to gradually increase it until the proper dose is reached. With this method Cohen states, tuberculin therapy will be robbed of its greatest danger, and many more patients will be able to take tuberculin than are now considered suitable for the excessive doses in general use at the present day.

99. **Use of Phosphorus in Diseases of the Lungs.**—Phosphorus in doses of 1/1000 of a grain has been successfully administered by Lemon in all classes of cases of lung disease during the past eleven years, and though, in the majority of cases it has been used in combination with other drugs, occasionally necessity compelled the use of it alone, and the success which has attended all cases where it has been used Lemon ascribes largely, if not altogether, to its presence in the mixture.

Oklahoma State Medical Association Journal, Muskogee

August, VI, No. 3, pp. 103-138

103 Milk as Food for Infants. J. T. Martin, Oklahoma City.
104 Plea for Routine Examination of Blood for Malarial Parasite. L. A. Mitchell, Frederick.
105 Defects within Lower Spinal Canal. H. Reed, Oklahoma City.
106 Importance of Pain and Shock in Operative Mortality. L. F. Watson, Oklahoma City.
107 Arteriosclerosis. W. G. Little, Okmulgee.

Southern Medical Journal, Nashville, Tenn.

August, VI, No. 8, pp. 493-560

108 Improved Technic and Equipment for Wassermann Test. W. Krauss, Memphis, Tenn.
109 Uncinariasis a National Problem. W. W. Dinsmore, Montgomery, Ala.
110 Some Practical Phases of Typhoid Problem. P. B. Moss, Montgomery, Ala.
111 Rectal Inoculation of Kittens as Aid in Determining Identity of Pathogenic Entamebae. S. T. Darling, Ancon, Canal Zone.
112 Schools for Feeble-Minded State's Best Insurance Policy. I. M. Hardy, Kinston, N. C.
113 Production of Beriberiform Polyneuritis in Fowls with Substances Other than Rice. C. Wellman, New Orleans.
114 Some Problems in Infant Nutrition. C. A. Rhodes, Atlanta, Ga.
115 Extra-Uterine Pregnancy. J. H. Carter, Memphis, Tenn.
116 Operations for Glaucoma; Iridotasis. D. Roy, Atlanta, Ga.
117 Tamponade Treatment of Accessory Sinuses and Its Effect on Intra-Ocular Inflammation. W. S. Manning, Jacksonville, Fla.
118 Gangrenous Tonsil. U. S. Bird, Tampa, Fla.
119 Retrospect of Five Hundred and Ten Obstetric Cases. J. B. Cranmer, Wilmington, N. C.
120 Unequal Presbyopia. A. W. Stirling, Atlanta, Ga.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Clinical Journal, London

July 16, XLII, No. 15, pp. 225-240

1 Value of Pain as Symptom of Renal Disease. J. S. Joly.
2 Some Acute Abdominal Perils. J. W. Leech.

July 23, No. 16, pp. 241-256

3 Ectopia Testis. W. M. Eccles.
4 Enlargement of Spleen. F. Taylor.
5 Diagnosis and Treatment of Lacrimal Affections. S. Stephenson.
6 Gout, Rheumatism and Rheumatoid Arthritis. T. M. Allison.

Medical Press and Circular, London

July 16, XCVI, No. 3871, pp. 53-78

7 Treatment of Glaucoma with Particular Reference to Newer Operations. S. Stephenson.
8 Duodenal Ulcer. X. Combes.
9 Hematemesis as Cause of Death. D. E. Core.
10 Intravenous Administration of Neosalvarsan in Syphilis. J. A. Nixon.

July 23, No. 3872, pp. 79-106

11 Reflexes and Their Significance. F. S. Palmer.
12 Medical Treatment of Phlebitis. H. Vaquez.
13 Apex Treatment for Pulmonary Consumption. W. Ewart.
14 Leukocyte Count in Gas and Ethyl-Chlorid Anesthesia. W. Guy, A. Goodall and H. S. Reid.
15 Treatment of Infantile Paralysis. P. B. Roth.

Quarterly Journal of Medicine, London

July, VI, No. 24, pp. 445-540

16 *Auricular Fibrillation. A. M. Gossage and J. A. B. Hicks.
17 Illustrations of Heart-Sound Records. T. Lewis.
18 *Incidence and Prognostic Value of Pulsus Alternans in Myocardial and Arterial Disease. J. D. Windle.
19 Cysticercus Cellulosae in Central Nervous System: with Account of Two Cases. R. Waterhouse.
20 *Pneumothorax Treatment of Tuberculosis of Lungs. O. Amrein and F. Lichtenhahn.
21 Localization of Function in Kidney. W. P. Herringham and J. W. Trevan.
22 *"Specific" Use of Salicylate in Acute Rheumatism: Consideration of Practical Objections. R. Miller.

16. **Auricular Fibrillation.**—The authors point out that while the exact cause of auricular fibrillation is unknown, it usually comes on in a heart in which there has been for a considerable period disease of the valves or myocardial change from inflammation or degeneration. Sometimes it arises suddenly where there has been no previous sign or symptom of heart disease. The authors suggest that possibly in some of these cases it occurs in hearts which were previously perfectly healthy. If this is true its essential cause must lie outside the heart and not in any anatomic or pathologic change in the heart itself. Sudden death in auricular fibrillation is probably due to the onset of fibrillation of the ventricles, and that some cases of sudden death both in diseased and healthy persons may be due to the simultaneous onset of fibrillation of both auricles and ventricles.

18. **Pulsus Alternans in Myocardial and Arterial Disease.**—Windle has had forty-five patients under observation, showing the pulsus alternans in the following conditions, stated in order of frequency: 1. Arterial and myocardial disease. 2. Chronic heart disease due to rheumatism. 3. Pneumonia. 4. Paroxysmal tachycardia. 5. Acute rheumatic carditis. It is Windle's experience that the presence of the pulsus alternans in a case of myocardial and arterial disease always adds to the gravity of the prognosis. It signifies disease of the heart progressing inevitably to a fatal end; and this is its meaning when present, as it not seldom is for a time, in patients whose clinical condition does not suggest serious unsoundness of the heart. In the case of thirty-three patients with myocardial and arterial disease under his observation, the diagnosis of the pulsus alternans was established in each case by polygraph tracings; and records were taken systematically during the time the patients were under notice. Five of these patients died within a year; two lived eighteen months, and two twenty-four months after the pulsus alternans first showed itself. Windle says that when once the pulsus alternans appears in a patient the subject of arterial disease it will never again be absent for long. The reason for its permanence in these cases is that the exhaustion of the heart which it expresses is due to degeneration of the heart muscle. In the early stages alternation becomes latent for a time through bodily rest, or the action of drugs which slow the heart, but eventually persists with rest and in spite of any measures of treatment yet tried.

20. **Pneumothorax Treatment of Tuberculosis.**—The authors report eleven cases of pulmonary tuberculosis in which they produced an artificial pneumothorax by means of nitrogen. Their results in summary are as follows: Case 1. Mainly monolateral tuberculosis of the lungs. Prognosis unfavorable. In consequence of the artificial pneumothorax a further development of the disease was averted and the toxic influence of the large infiltration of the right middle and lower lobe was eliminated, as shown by the disappearance of the fever. A complete cure was impossible on account of the large cavity, but this had become smaller by a half during the year of the duration of the pneumothorax. It was, however, impossible to eliminate the influence of the intoxication of the whole organism, after some years of illness, and entirely to check the secretion of the cavity. The fatal issue was entirely due to the amyloid degeneration of the kidneys, which had been diseased for sixteen years. The condition of the compressed lung, as shown at the autopsy, was absolutely satisfactory, from the point of view of the success of an artificial pneumothorax. Case 2. Monolateral tuberculosis of the whole left lung, with tendency to hemoptysis, which indicated the necessity of an artificial pneumothorax. In this case the hemoptysis was entirely checked. There was a general amelioration and capacity to resume work. Seven months afterward, when all the nitrogen was absorbed, a relapse (entirely due to his own carelessness) occurred, rendering the prognosis extremely doubtful. In future, the authors state that they will, with similar cases, go on with the punctures for a long time, if only to keep such a patient under medical control. The success in this particular instance can be claimed as definite, and the hemoptysis was completely checked.

Case 3. Advanced monolateral phthisis with large apical cavity. The operation produced a compression, and the expectoration was greatly and definitely reduced. Contrary to their expectations, it was impossible to produce a partial pneumothorax in a case which *a priori* did not seem to be a favorable one for this form of treatment. Case 4. In this case of advanced monolateral tuberculosis, evidencing activity and deterioration, the operation of pneumothorax produced a wonderful effect. In a short time all symptoms of deterioration and toxity were completely arrested. Case 5. Advanced monolateral tuberculosis of the right lung, with pyrexia. After operation, disappearance of fever, decrease of cough and expectoration. A durable result is probable, although the patient is not sufficiently careful, thereby undergoing considerable risk. Case 6. Advanced tuberculosis of the entire left lung with a hopeless prognosis: high hectic fever for three years, abundant expectoration; a picture of general deterioration and daily loss of ground. But, after the compression of the lung, there was instant cessation of the fever, with decrease of sputum to one-fifth of its quantity. Five months only have lapsed since the production of the pneumothorax, and a very considerable time must pass before a definite healing takes place, but the authors are justified in hoping that this healing will be effected, if the organism, which for so long a time was weakened and intoxicated, has sufficient power of resistance to conquer the alteration of the circulation. In any case, this patient's life has been for the moment saved by the production of an artificial pneumothorax.

The remaining five cases were not so definitely successful. Personal experience with the pneumothorax treatment convinces the authors that many apparently hopeless cases of monolateral tuberculosis of the lungs can be arrested, and, further, may be healed, and even if perfectly satisfactory results are few and far between, the trial of the treatment is legitimate.

22. **Salicylate in Acute Rheumatism.**—The objection that the larger doses of salicylate do not imply increased absorption of the drug is held by Miller to be without foundation. The objection that the larger doses are too prone to produce vomiting to be of value, he says, is only partially true. The production of vomiting is more a matter of the type of case under treatment and the methods of administration than the size of the dose employed. The vomiting produced in severe cardiac cases must necessarily be a limitation to any antirheumatic action which the drug may possess in rheumatic carditis. The objection that large doses are too prone to produce acid intoxication to be of value is also only partially true. The method of administration is of more importance than the size of the dose. The objection that the larger doses are dangerous and tend to increase fatalities, Miller states,

is not supported by the series of cases examined. It is again a question of knowing how and when to use the drug. The objection that the specific use of salicylate is unsound, as relapses, particularly of nodules, are not prevented, is not well supported by the series of cases examined. Most of the relapses occurred on or after small doses or a short period of administration of the drug: cases taking large doses showing some immunity to relapses. Nodules are not generally more commonly found in relapses than are other manifestations; and where they develop under large doses it seems that they signify little, if any, fresh activity on the part of the infection.

Annales de Gynécologie et d'Obstétrique, Paris

July, XL, No. 7, pp. 385-448

23 *Diffuse Edema of the Fetus. C. Sauvage.
24 Dissecting Mole. Curtis and Oui. Commenced in No. 6. See Abstract 63, p. 439.

23. **Diffuse Edema of the Fetus.**—Sauvage has recently encountered two cases and discusses the factors engaged in the production of the fetal edema. In some cases malformation of viscera or abnormal composition of the blood is evidently responsible, both a mechanical cause and a toxic cause being possible. When the placenta is likewise edematous, a toxic origin is more probable, although the edema may back up into the placenta; Fischer has recently reported a case in which the edema in the fetus was undoubtedly due to mechanical causes but the cord was very short and the placenta was also edematous, weighing 500 gm. In one of the personal cases reported Sauvage found that the proportion of sodium chlorid in the blood was much above normal and it was still higher in the edema fluid than in the blood-serum. These facts are significant as they suggest that an excess of sodium chlorid or retention of sodium chlorid in the mother may have been responsible for the diffuse edema in the fetus. The excessive proportion of sodium chlorid in the fetal fluids was accompanied by serious lesions in the liver, kidneys and spleen. The mother's kidneys were not functioning properly, the insufficiency of the kidneys being manifested by edema during the pregnancy and by tests repeated three weeks after delivery. She was a woman of 44 with no morbid antecedents except edema and lassitude during her three previous pregnancies, two of them terminating by the death of the fetus. There is evidently chronic nephritis but it persists latent except when the kidney functioning is hampered by a pregnancy. There were no signs of syphilis in either case. Prouvost three years ago warned of the expediency of reducing the intake of salt during pregnancy.

Archives Générales de Médecine, Paris

July, XCII, No. 7, pp. 581-672

25 Direct Intratracheal Medication Through Extremely Narrow Tracheotomy Cannula Leaving Natural Passage Still Open. (La trachéo-fistulisation, traitement méthodique des infections broncho-pulmonaires, graves, fétides et tuberculeuses: avec quelques remarques sur l'alimentation et la suralimentation pulmonaires.) G. Rosenthal.

Archives Mensuelles d'Obstétrique et de Gynécologie, Paris

July, II, No. 7, pp. 1-47

26 Surgical Anatomy of Pelvic Ureter. E. Papin and R. de B. Lagarde.
27 Injury of Ureter During Abdominal Hysterectomy and Its Treatment. R. de B. Lagarde.

Journal de Chirurgie, Paris

July, XI, No. 1, pp. 1-140

28 *Spontaneous Hemorrhage in Vicinity of Kidney. (L'hématome périrénal spontané.) A. Lippens.
29 Outward Dislocation of the Clavicle. F. M. Cadenat.

28. **Spontaneous Perirenal Hematoma.**—Lippens summarizes twenty-three cases from the literature and remarks that the symptoms closely resemble those of a ruptured tubal pregnancy. It has never been accurately diagnosed before the operation; left to itself it is always fatal. The seven patients not given operative treatment all died. Even at the best, the outlook is serious as 25 per cent. of the patients operated on succumbed. In ten cases the hematoma was merely opened and the pocket tamponed; four of these patients died. In six cases the kidney had been injured so much by the compression that it was at once removed, with recovery of five of the six patients. If the blood pours out copiously and persistently or if the kidney has been irreparably damaged, nephrectomy is indispensable. As the diagnosis is generally so uncertain, Lippens advises a transverse incision or Verhoogen's paraperitoneal incision.

Journal de Médecine de Bordeaux

July 20, LXXXIV, No. 29, pp. 463-474

30 Pathogenesis and Classification of Insidious Tuberculous Congestions at the Base of the Lungs. (Les basites tuberculeuses.) H. Vennat and P. Lafargue.
31 *Treatment of Epilepsy. Pitres.

31. **Treatment of Epilepsy.**—Pitres remarks that the consensus of opinion is now that the seizures of epilepsy are brought on by some perversion in the metabolism of proteins, and consequently the diet should be regulated with this in view, keeping the unstable gastro-intestinal tract under constant supervision. De Fleury even forbids the use of milk and keeps his patients on a strictly vegetable diet, with as little salt as possible. Pitres adds that ligation of the carotids has two successful cases to its credit, and two out of six cases have been reported as successes following ligation of the superior longitudinal sinus. Operations on the sympathetic nerve and lumbar puncture have invariably failed to relieve, as also decompressive cranial operations in essential epilepsy. Regarding the seizures as due to a toxemia, elimination of the toxins should be promoted in every way, especially by venesection, withdrawing from 300 to 500 gm. of blood, following with infusion of 250 or 500 c.c. of saline, and flushing the intestines copiously with cold boiled water, giving the patient bromid in milk or in the saline infusion. Here lumbar puncture may render valuable symptomatic services, with cold baths if the temperature runs up. Symptomatic epilepsy subsides after removal of the cause, possibly by correction of a visual defect or removal of adenoids. Treatment as for syphilis may prove unexpectedly successful. Traction, compression or a ring of blisters above the part involved in jacksonian epilepsy may also cure the tendency to spasm. He has witnessed a complete cure follow the application of ten or fifteen blisters in turn one above the other.

Lyon Médical, Lyons

July 20, CXXI, No. 29, pp. 97-140

32 Negative Value of Salvarsan Treatment for Tuberculosis. P. Courmont and Durand.

July 27, No. 30, pp. 141-180

33 Fatal Embolism of Anterior Coronary Artery; Fourth Case on Record. L. Gallavardin and P. Dufourt.

Presse Médicale, Paris

July 16, XXI, No. 58, pp. 585-592

34 The Gases in the Blood. G. Weiss.
35 *Misleading Findings in Radioscopy of the Stomach. (De l'évacuation gastrique.) A. Martinet and L. Meunier.

July 19, No. 59, pp. 593-604

36 *Biochemical Aspects of Alcohol Intoxication. M. Nicloux.
37 Primary Acute Orchitis in Children. L. Ombrédanne.

July 23, No. 60, pp. 605-612

38 Classification of Glands with an Internal Secretion according to the Function of their Products. E. Gley.
39 Vaccine Therapy of Whooping-Cough. (Vaccinothérapie anticoquelucheuse.) L. Lagane.
40 Difference in Radial Pulse in Syphilitic Aortitis. L. Lavastine and Vinhit.

July 26, No. 61, pp. 613-624

41 Hypophysis Extract as a Purgative. (Emploi de la médication hypophysaire comme agent entérocinétique.) B. A. Houssay and J. Beruti.
42 Salvarsan in Syphilis. (Comment peut-on et doit-on employer le salvarsan.) L. Brocq.

35. **Radioscopy of the Stomach.**—Martinet and Meunier state that the bismuth gruel which the patients are given for radioscopy is a most unappetizing mess, generally choked down by the patient with repugnance, and it does not elicit

the normal responses in the stomach. Consequently the findings on radioscopy are not those of the physiologic functioning of the stomach but represent conditions quite different from those that follow an ordinary meal eaten with appetite. Consequently they declare that the findings are no criterion of the actual functional condition of the stomach. They suggest that the patient should take an ordinary test meal, made appetizing, and the bismuth suspension should be taken after a given interval: this would surprise the stomach at its normal work and the findings then would be truly instructive.

36. **Biochemical Aspect of Alcohol Intoxication.**—Nicloux describes a method with which he has been able to detect minute amounts of alcohol in the blood and other fluids and tissues of the body and of the fetus, and reports his findings therewith. He distils out the alcohol after mixing the substance to be examined with picric acid, and estimates the proportion present by the bichromate-sulphuric acid method. Among the practical results of his research are the constant findings that alcohol ingested passes directly into the genital glands and secretions in considerable proportions. The alcohol seems to pass with exceptional facility into the testicles and into the fetal blood. When the male organism is under the influence of alcohol it passes into the testicles, prostate and the semen, the toxic action of the alcohol thus being liable to be directly exerted on the ovum when fecundation occurs under the influence of alcohol. On the other hand, alcohol taken by a pregnant woman at any time during her pregnancy is liable to pass directly into the blood of the fetus, the tests showing very little difference between the alcohol content of the maternal and the fetal blood. Outside of pregnancy, the alcohol passes to the ovary and into its secretion. Alcohol passes rapidly out of the system, in twenty-four hours at most. But during this period, if fecundation occurs, it is while the genital glands and genital secretions are feeling the noxious influence of the alcohol poisoning the spring of life at its source.

Revue de Médecine, Paris

July, XXXIII, No. 7, pp. 521-600

43 *Pathogenesis of Epilepsy. A. Pierret.
44 Infectious Erythemas Occurring during Measles. E. Weill and C. Gardère.
45 Anaphylaxis by a Pulmonary Fungus. (Mycoderma pulmoneum. Sensibilisation de l'organisme par un champignon du poumon.) L. Jannin.

43. **Pathogenesis of Epilepsy.**—Pierret found by animal experimentation that epilepsy can be produced by various sorts of traumatism of the nervous system. He believes that in many, perhaps all, cases of so-called idiopathic epilepsy the patients have had some infectious disease localized in the nervous system, leaving behind it cicatricial areas. Later some intoxication takes place and toxic products, acting on these sclerotic foci, cause convulsions, which may be motor, sensory or psychic. The rational treatment therefore is to protect the patient from all possible causes of intoxication from within or without.

Revue Pratique d'Obstétrique et de Gynécologie, Paris

July, XXI, No. 7, pp. 193-220

46 Palliative Vaginal Hysterectomy for Cancer of the Cervix with Recurrence after Ten Years. A. Charrier and A. Parcelier.

Archiv für klinische Chirurgie, Berlin

CI, No. 4, pp. 845-1125. Last indexed July 26, p. 311

47 *The Epidural Space. B. Heile.
48 Experiences at the Seat of War. (Kriegschirurgische Erfahrungen auf der Tripolis-Expedition des Deutschen Rothen Kreuzes.) C. Goebel.
49 The Work of the Pointed Bullet. (Wirkung des Spitzgeschosses.) F. Colmers.
50 Fascia Flap for Prevention of Postoperative Hernia and Protrusion. G. A. Waljaschko and A. A. Lebedew.
51 Experimental Research on Infection of the Thoracic Cavity. H. Burckhardt.
52 *Spontaneous Healing of Wounds in Lungs. M. Tiegel.
53 Surgery of Large Intestine, Rectum Excepted: Thirty-One Cases. (Zur Chirurgie des Dickdarms, ausser dem Mastdarm.) B. K. Finkelstein.
54 Autoplastic Flap of Fat in Treatment of Defects in Dura and Brain; Experimental Research and One Successful Clinical Case. (Autoplastische Fetttransplantationen bei Dura- und Hirndefecten.) E. Rehn.
55 Dysphagia and Dyspnea from Malformation of Organs; Two Operative Cases. C. Girard.
56 *Ultimate Outcome of Arthrodesis for Paralyzed Ankle. (Endresultate der Lexer'schen Arthrodese am Sprunggelenk.) M. Schewandin.
57 Stab and Firearm Wounds Involving Both Chest and Abdomen. (Ueber penetrirende Brustbauchverletzungen.) N. Guleke.
58 Evil Effects of Chloroform in Laparotomies Done for Acute Inflammatory Processes. (Wahl des Narcoticums bei Operationen wegen acut entzündlicher Processe in der Bauchhöhle.) O. Sprengel.
59 Drainage of Hepatic Duct. (Transjejunale Hepaticusdrainage.) O. Nordmann.
60 Operative Treatment of Cortical Epilepsy; Traumatic and Non-Traumatic. W. J. Rasumowsky.
61 *Operations on Seminal Vesicles. (Operationen an den Samenblasen.) F. Voelcker.
62 *To Expel Blood in Operations on the Skull. (Ueber Verminderung des Blutgehaltes bei Schädeloperationen.) C. Ritter.

47. **The Epidural Space.**—Heile describes the technic with which it is possible to inject an anesthetic or other fluid into one side of the epidural space and thus act directly and exclusively on the nerves on that side. The best results with this as with all other methods of treatment of sciatica are obtained in the cases in which there is no inherited taint of the kind, the patients had been previously healthy and the nerve shows signs of irritation, namely, tenderness along the nerve, hyperesthesia of the skin, especially in the area of the fifth lumbar vertebra, Lasègue's sign, etc. With a history of preceding rheumatism or sciatica in the parents, the epidural injections may temporarily relieve but there are generally more or less irreparable lesions and a tendency to atrophy of the gluteal muscles and the muscles of the legs, and more or less changes in the reflexes. When he notes these signs of neuritis of the roots, he abandons hope of a permanent cure from the epidural injections. If the patient insists he injects merely 30 or 40 c.c. of a hypotonic salt solution to refrain from further irritating the nerve. The injection may even aggravate the pain in these cases; much better results are liable to be attained with weak galvanic electricity. On the other hand, in the first group of cases, especially when complicated by scoliosis of the lumbar vertebrae, suggested early by the lowness of the anal fold on the affected side, most excellent results followed the injection after the failure of months of other measures, internal and external. In these cases he injected as large amounts of the fluid as possible, from 80 to 150 c.c., injected through the sacral foramen or into the spine, aiming to loosen up the nerve itself, cause it to swell and thus promote the softening up and absorption of the products of inflammation. This swelling up of the nerve is a painful process, and this pain is the sign that the nerve itself has been reached. It may require ten such injections to complete the cure, and it is difficult to convince the patients of the advantages of submitting to repetitions of this painful procedure. Consequently the sphere of the method is limited. He has never witnessed any durable untoward by-effects from it in any instance. The epidural space cannot be depended on for reliably blocking the nerves for local anesthesia. The article is illustrated.

52. **Spontaneous Healing of Wounds in the Lungs.**—Tiegel reports the case of a man of 38 who had five ribs fractured by a falling beam and the lung ruptured. Emphysema developed over nearly the whole trunk and head. As the suffocation became threatening, Tiegel made an incision 4 cm. long in the neck, down to the trachea, and applied a vacuum cup connected with a water jet pump, with valve regulator. The negative pressure in the cup was kept at 30 cm. water. The result was immediate relief and in half an hour the patient was able to open his eyes, which before had been impossible from the emphysema of the lids. The aspiration stopped at one time but continued after the pressure had been temporarily increased, aspirating fluid along with the air. Recovery was prompt and smooth, the lung healing spontaneously in five days as was evident from the behavior of the interposed

valve. Tiegel thinks that the results in this case were better than could have been attained with any operation, no matter how extensive. He gives further illustrations of the lungs from six dogs showing the smooth spontaneous healing after extensive stab wounds. One lung showed the wound tightly stuck together forty hours after the injury, sustaining pressure up to 45 mm. mercury. These experiments not only illustrate the remarkable tendency to spontaneous repair and healing but also the spontaneous arrest of hemorrhage after such injuries of the lungs.

56. **Disappointing Outcome of Bone-Peg Arthrodesis.**—Schewandin was able to reexamine recently five patients who had been treated by Lexer's technic for paralysis of the ankle, driving a peg of bone into the joint. The peg was taken from the tibia or the fibula of the leg above, with its marrow and periosteum. Besides the five cases described in detail he has records of four other patients, all with an interval of from two to five years since the operation. Good results were obtained in only a very few instances; the bone was gradually absorbed and then conditions were no better than before the measure had been applied. None of the patients experienced any ill effects from the operation on the bone above, and only one of the patients had pain in the pegged ankle, but as the bone peg was absorbed, the joint grew loose again and the toes or the whole foot dragged.

61. **Operations on the Seminal Vesicles.**—In two of Voelcker's fourteen cases the operation on the seminal vesicles was done for a tuberculous process, once for myoma, once for carcinoma, this patient dying six months later from metastasis. In three other cases the trouble was an infectious catarrh of the bladder and kidney pelvis involving the seminal vesicles; in another case the inflammation in and around the seminal vesicles was the work of the gonococcus and the kidney pelvis was also involved. Marked improvement followed the operation although this patient is still under treatment for his pyelitis; the anticipated abscess in the vesicle region was not found and the trouble must have been merely acute inflammatory adhesions. A simple incision seemed to answer the purpose and the relief was so prompt and complete that Voelcker commends this little operation in such cases to ward off danger from obstruction to the outflow of urine from the kidney pelvis. Only he advises in this case to keep the wound open to drain for several weeks; the two weeks of drainage in his case were evidently not long enough. There was slight fever after the drain was removed and pain in the kidney, but these disturbances were transient. In another case a focus of inflammation had persisted in the seminal vesicles and was evidently the source for recurring gonorrheal joint trouble; the operation on the vesicles was followed by permanent subsidence of the joint symptoms. The second day after the operation the patient said that his previous pain in hip, shoulder and heel was gone; by the fourth day he had no pain except in the costal arch, and by the end of the second week he was free from pain of all kinds but the joints were still stiff. In another case pneumococci were responsible for the vesiculitis; there was no history of gonorrhea. This patient was a man of 59 who for two years had had pains on micturition and there was about 45 c.c. of residual urine. During the last year there had been pains in the sacral region and increasing stiffness in the lumbar spine, knees and hip joints so the patient could walk only with difficulty. The prostate was of normal size and soft but the vesicles were 7 and 8 cm. long and much swollen. The joint troubles have been much improved since the operation, and it is possible that the swelling of the seminal vesicles may have induced them by reflex action as there was nothing else found to explain them; the nervous and cardiovascular systems seemed to be clinically normal. In these and the other cases the assumption that the chronic inflammation of the seminal vesicles was responsible for the pains and stiffness in the joints is rendered plausible by the relief that followed the operation on the vesicles, although Voelcker never witnessed such wonderful results as Fuller has reported. The causal relationship with bladder and kidney affections seems more obvious

62. **Shutting Off the Blood from the Brain for Operations.**—Ritter reports three cases and numerous experiments on animals which apparently sustain his assertion that both carotid arteries can be clamped for a period of thirty minutes, thus shutting off the blood supply to permit an extensive operation on the skull, without permanent injury to the patient. His experience further shows that anemia of the brain for a period up to thirty minutes, from criminal violence or trauma, does not necessarily entail irreparable lesions and permanent cerebral disturbances.

Berliner klinische Wochenschrift

July 21, L, No. 29, pp. 1333-1380

63 Recent Progress in Optics and Gullstrand's Share Therein. (Einfluss Gullstrand's auf die Entwicklung der neuren Brillenoptik und die Einführung punktuell abbildender Brillen.) Gleichen.
64 *Comparative Pathology in Plants and Animals. (Aehnliches und Gegensätzliches in der pflanzlichen und tierischen Pathologie.) E. Bauer.
65 *Influence of Calcium Salts on the Kidney. (Einwirkung von Kalksalzen auf die Phloridzinglykosurie.) M. Jacoby. (Einwirkung von Kalksalzen auf die Funktionen der Niere bei gesunden und kranken Menschen.) G. Eisner.
66 *Action of Salvarsan on Kidney Functioning, Especially During Mercurial Intoxication. A. Loewy and W. Wechselmann.
67 New Instruments for the Duodenum and the Small Intestine. M. Einhorn (New York).
68 Mesothorium in Gout and Rheumatism. T. Görges.
69 *Adiposis Dolorosa. W. Kloninger.
70 *Treatment of Abortion. S. Hammerschlag.
71 *Air in the Abdomen after a Laparotomy. M. Cohn.
72 Radio-Activity Scale. (Ueber einen neuen Apparat für sämtliche Messungen der Radioaktivität.) B. Szilard.
73 The Backhaus Method of Preparing Milk for Infant-Feeding. (20 Jahre Erfahrung in der Kindermilchbereitung.) A. Backhaus.
74 Further Measures for the Campaign Against Tuberculosis. J. Landsberger.

64. **Comparative Pathology in Plants and Animals.**—Baur gives an interesting review of the analogies and the differences between pathologic processes in the vegetable and animal kingdom. The fungi are the most prominent parasites of plants but there are a number of true bacterial affections in plants. Their effect seems to be exclusively local, no general influence ever being apparent from them, and hence there is no production of antibodies in plants. New growths on plants may resemble tumors on animals, but their etiology is even more obscure and there seems little hope of their helping to clear up the problem of cancer.

65. **Action of Calcium on the Kidneys.**—Jacoby reported last year the history of a case of fibrous ostitis in which a brilliant cure followed administration of calcium and the metabolic findings showed retention of calcium at the time and later. When treatment was commenced there was an exaggerated output of calcium in the urine, even more than ever occurs with phosphaturia, but under treatment with the calcium salts the output declined. In order to explain this apparently paradoxic phenomenon, Jacoby gave calcium to dogs after glycosuria had been induced by the subcutaneous injection of phloridzin. At once or more gradually the urine contained less and less of sugar, acetone and nitrogen until finally it became nothing but almost clear water; the elimination of water did not seem to be affected. When there was no further elimination of anything but water, the dog died. The calcium salts used were the chlorid, acetate and lactate. An unmistakable function-reducing influence from them was apparent, and Eisner confirms this by report of similar experiments on five patients with kidney disease and two healthy persons with thirty examinations made of the output of sugar, acetone, albumin and nitrogen before administration of the calcium salts and thirty again afterward. In a few cases the kidney functioning showed no difference; it persisted equally good or equally bad after the calcium had been taken, but in the other cases a marked function-reducing action was unmistakable. The findings after death in the dogs and the clinical experiences seem to show that the kidney filter becomes less porous—possibly from mechanical obstruction by the calcium particles. Eisner declares that a drug which can thus cause retention of substances, natural or

foreign to the organism, must be used with great caution as the effect is a direct impairment of kidney functioning. The fact that the percentage of albumin becomes reduced under the influence of the calcium is liable to be misinterpreted as a sign of improved kidney functioning, when in reality it is just the reverse.

66. **Influence of Salvarsan on the Kidneys.**—The research reported confirms the injurious action of salvarsan on kidneys which are already suffering from the action of mercury. Experiments on dogs under the influence of mercurial intoxication showed that the injurious influence was most marked on the water-eliminating function, up to complete anuria. It was found further that the urine might persist free from albumin to the end. In some of the dogs complete anuria followed the injection of salvarsan. In giving salvarsan, therefore, the necessity for supervising the diuresis is at once apparent, and the unreliability of trusting to the albumin content as an index of the functional capacity of the kidneys. The research reported further emphasizes that the danger from salvarsan is materially enhanced when the kidneys were not previously sound or were suffering from the effects of systematic mercurial treatment. It warns further against the practice of a combined mercury-salvarsan course of treatment.

69. **Adiposis Dolorosa.**—Kloninger's patient was a woman of 51 with a typical case of the painful deposits of flesh to which Dercum has given the above name. Besides the pain, restlessness and "hot flashes," there was much physical depression. An ovarian tumor had been removed two years before and the symptoms had come on since then. She was given thyroid tablet treatment systematically for four months, after which there was marked subjective and objective improvement. Mild hydrotherapy aided to complete the cure, with massage after the tissues had become less sensitive. From a helpless, bed-ridden condition, the woman is now able to be up and about, free from pain, "flashes," etc. Sézary recently published a similar case in which a course of ovarian treatment failed to relieve but a change then to thyroid treatment was speedily followed by a complete cure. Fresh thyroid was given in this case.

70. **Abortion.**—Hammerschlag insists that unless there are unmistakable signs of actual abortion, such as expulsion of scraps of fetal membranes, rudimentary contractions of the uterus, possibly only to be palpated and not experienced by the patient as pains, gaping of the internal os, fever, etc., uterine hemorrhage during the first months of a pregnancy should always be treated on the principle of preserving the pregnancy. The statements of the patient must generally be disregarded. Fromme found that 17.9 per cent. of 157 women with more or less uterine hemorrhage during the first months of pregnancy went on to term, and all but three had well developed children. Three had had hemorrhage for five days, three for a week, five for two weeks, three for three weeks, three for four weeks, seven for from five to seven weeks, one for three months, and one uninterruptedly for five months. Besides these groups, three other women went on to term after having had hemorrhage during the later months of the pregnancy. Hammerschlag says that with missed abortion, treatment should be expectant unless forced by complications. Febrile abortion, with the infection restricted to the uterus, requires its evacuation but done with extremest care to avoid injury to the tissues. Do not dilate the cervix unless absolutely necessary and then do it with laminaria, not metal. Then rinse out the uterus with 50 per cent. alcohol, then separate the membranes with the finger, not the curet. Then remove the scraps with the abortion forceps introduced under the guidance of the eye or with two fingers inserted in the cervix. The forceps must never be introduced farther than to just above the internal os. The scraps are worked into its jaws with the fingers, and the forceps is then drawn out and the uterus cavity examined with the fingers anew for more scraps. It is remarkable, he states, how even the inexperienced can thus clear out the uterus without injury to the tissues when a forceps without any sharp edges (Winter's) is used in this cautious manner, always under the guidance of the fingers.

71. **Air in the Abdomen after a Laparotomy.**—Cohn says that in a number of instances he has found that the supposed tympany following operation was merely the result of the presence of air sucked into the abdomen during the laparotomy. In most cases the air is gradually absorbed without harm, but if the heart is frail, the upward displacement of the diaphragm from the air, which naturally rises to the top of the abdominal cavity, may hamper it seriously, besides the effect on the respiration and intestines. The air may even compress the intestines enough to aid in producing postoperative paresis of the bowels. In one case during injection of nitrogen to make an artificial hydrothorax some of the gas escaped into the abdominal cavity and it was not completely absorbed until after six weeks.

Correspondenz-Blatt für Schweizer Aerzte, Basel

July 19, XLIII, No. 29, pp. 897-928

75 Recent Experimental Research on Alimentary Diseases. Saltykow.
76 Action of Opium Alkaloids and Their Combinations. E. Bernoulli.

July 26, No. 30, pp. 929-960

77 Surgical Experiences at the Seat of War. (Aus dem Balkankriege.) C. A. Pettavel.
78 Altitude and the Behavior of the Leukocytes. (Verhalten der Leukocyten im Höhenklima.) Wanner.

Deutsche medizinische Wochenschrift, Berlin

July 17, XXXIX, No. 29, pp. 1393-1440

79 *Azoospermia not Necessary Consequence of Bilateral Disease of the Testicles. (Zur Frage der Zeugungsfähigkeit bei bilateraler Nebenhodentuberkulose.) P. W. Fürbringer.
80 *Research on Animals Rendered Free from Leukocytes by Radio-Activity. (Studien am aleukozytären Tier: Ueber die Genese Lymphozyten in den Exsudaten seröser Höhlen.) Lippmann and Plesch.
81 *Behavior of Blood after Thyroidectomy. (Experimentelle und klinische Untersuchungen über das Verhalten des Blutes nach totaler und partieller Entfernung der Schilddrüse.) P. Reckzeh.
82 *Hematology in Service of Psychiatry. J. H. Schultz.
83 *The Acidity of the Stomach in Diagnosis of Gall-Bladder Disease. (Ueber Aziditätsverhältnisse des Magens bei Erkrankungen der Gallenblase und ihre therapeutische Nutzanwendung.) A. Ohly.
84 Indications for the Method of Duodenal Feeding. M. Einhorn (New York).
85 *Access to Hypophysis Cerebri Through Top of Skull. (Der intrakranielle Weg zur Exstirpation von Hypophysengeschwülsten.) W. Rupp.
86 *Simplified Technic for Cultivation of Syphilis Spirochetes. (Vereinfachung des Verfahrens zur Reinzüchtung der Syphilisspirochäten.) J. Schereschewsky.
87 Absorption of Mercury with Inunctions. H. Boruttau.
88 Articular Rheumatism in Soldiers. (Zur Pathologie und Therapie des Gelenkrheumatismus in der Armee.) K. P. Dannehl.
89 Electric Treatment of Obesity. (Erfahrungen mit dem Bergonisieren, einer neuen Methode für Entfettungskuren und Muskelgymnastik.) A. Veith.

79. **Azoospermia after Epididymitis.**—Fürbringer concludes from his own and others' experiences that bilateral tuberculous epididymitis is less liable to entail azoospermia than the gonorrheal. His experience in more than a thousand cases of azoospermia has been that it is incurable in about 80 per cent. of the bilateral gonorrheal cases; others have reported still higher percentages. On the other hand, the anatomic conditions with a tuberculous process may leave the passage partly permeable.

80. **Exudates in Aleukocytic Animals.** — Lippmann and Plesch found that absolutely no leukocytes could be detected in the blood of guinea-pigs after intracardial injection of thorium x. The local response then to injection into the peritoneum of a culture of swine-plague bacilli was a local exudation exclusively of monocytes. Irritation of the muscle induced merely necrosis, no inflammation. The small lymphocytes must consequently be derived from the endothelium and have no specific antigen character.

81. **The Blood after Thyroidectomy.**—The research was done on dogs and the minute details of the blood before and after are tabulated. The animals developed a secondary anemia usually about a week after the removal of the thyroid and

the blood-count revealed injury of the bone-marrow functioning, as in anemia from the action of blood-poisons. There was usually a relative lymphocytosis, the experimental results thus harmonizing with clinical experience.

82. **Diagnosis from the Blood in Psychiatry.**—Schultz supplies data to show that the leukocyte count has great differential value in psychiatry, especially in the diagnosis of epilepsy and dementia praecox. The stupor in the latter seems to be accompanied by a specific blood-picture, *especially an accumulation of erythrocytes in the capillaries of the lobe* of the ear. This "capillary erythrostasis" is the hematologic manifestation of the "pseudo-edema" of dementia praecox.

83. **Acidity of the Stomach with Gall-Bladder Disease.**—Ohly states from his research on forty-three patients with gall-bladder disease that with incipient trouble of this kind the gastric acidity seems to be above normal. As the gall-*bladder disease* progresses, however, the gastric acidity declines until there is anacidity or actual achylia in about 70 or 80 per cent. of all cases *of cholecystitis. This* subnormal acidity should be borne in mind in treating the cholecystitis, and it also may aid in differentiating between pyloric or duodenal ulcer and cholelithiasis in some cases.

85. **Intracranial Access to the Hypophysis.**—In a case described the tumor in the hypophysis had grown inward and was thus accessible only from directly above. Rupp found it feasible and comparatively simple to *turn back a bone and* soft part flap from *the orbit to the coronal suture, push* the brain out of the way and shell out the tumor. There proved to be already metastases in the brain and elsewhere so the operation failed to cure the patient. He survived thirty hours and there was no trace of postoperative paralysis, but he did not regain consciousness although still responding to external stimuli, and micturition was spontaneous.

86. **Cultivation of Syphilis Spirochetes.**—Schereschewsky calls attention to the extremely simple and reliable technic which permits cultivation of the spirochetes in pure cultures. The medium is sterile serum derived from different horses. A test-tube is filled nearly up to the cork with this serum and heated in a water bath at 65 C. until it is no longer fluid. An aseptically excised syphilis papule is then pushed half way down into the test-tube, with care not to disturb the serum any more than is actually necessary. Tapping on the side of the tube will let any air left in the tube escape. The tube is then plugged tight with the cork *again and* kept at 37 C. for eight days. The tube is then cut off below the papule and some of the culture medium is transferred to a slide and examined with the dark field microscope. The cork prevents the contents from drying out as with a cotton plug.

Deutsche Zeitschrift für Chirurgie, Leipsic

June, CXXIII, Nos. 1-2, pp. 1-220

90 Suture of Vessel with Aneurysm. (Anwendung der Gefässnaht bei der Behandlung der Aneurysmen.) E. Tschernachowski.
91 Value of Unpedunculated Flaps to Reenforce Sutures. (Vergleichende Studien über den Nahtverstärkungswert des ungestielten Netz-, Peritoneal- und Mesenteriallappens.) J. Saski.
92 Sarcoma of the Intestines. (Darmsarkome.) W. Wortmann.
93 Amputation in Shoulder for Recurring Cancer of the Breast. (*Vorschlag zur Abnahme des Armes nebst zugehörigem* Schultergurtel bei gewissen Formen und Rezidiven des Mammacarcinoms.) F. Franke.
94 Correction of Deformity of Lower Jaw. (Zum osteoplastischen *Ersatz von Unterkieferdefekten.*) *R. Göbell.*
95 Dislocation of the Bones of the Hand. (Luxatio intercarpea.) L. v. Mayersbach.
96 Congenital Dislocation of the Knee. A. Wachter.
97 General Anesthesia Under Atmospheric Overpressure. (Ueber-*drucknarkoseapparate.*) W. Gerlach.

Jahrbuch für Kinderheilkunde, Berlin

LXXVIII, Supplementary No. pp. 1-308

98 Metabolism in an *Atrophic Infant.* K. Frank and G. Wolff.
99 *Dietetic and Therapeutic *Measures* in Spasmophilia. (Die Einwirkung alimentärer und pharmakodynamischer Faktoren auf den Verlauf der Spasmophilie.) F. Zybell.
100 No Hereditary Pred*isposition* to Scarlet Fever. (Giebt es für Scharlach und seine Komplikationen eine familiäre Disposition?—Ande [illegible]) A. Mathies.
101 Development *of the Chest and Its* Relation to Rachitis. (Die Entwicklung des Thorax von der Geburt *bis zur Vollendung* des Wachstums und ihre Beziehungen zur Rachitis.) E. *Zeltner.*
102 Case of Myotonia Congenita. (Zur Pathologie und Klinik *der* Myotonia Congenita—Oppenheim.) L. Kaumheimer.
103 **Relation of Intestinal Intoxication* to the Sympathetic Nervous System. H. Hirschfeld.
104 Hereditary Predisposition to Fractures. (Ueber *angeborene* Knochenbrüchigkeit.) K. Bamberg and K. Huldschinsky.
105 *Post-Diphtheritic *Cerebral Paralysis.* A. L. Dynkin.

July, LXXVIII, No. 1, pp. 1-124

106 Albumin-Cream Milk in Infant-Feeding. (Säuglingsernährung mit einer *einfachen* Eiweiss-Rahmmilch.) E. Feer.
107 The Spasmophilia Problem. E. Freudenberg and L. Kloeman.
108 Is There a Specific Odor in Infectious Diseases? (Gibt es *einen spezifischen Geruch bei* Infektionskrankheiten?) N. Krasnogorski.
109 Chronic, Non-Tuberculous Lung Disease in Young Children. R. Lederer.
110 Diverticulum Above *Cicatricial* Stenosis *of the* Esophagus. *H.* Flesch.

99. **Dietetic and Therapeutic Treatment of Spasmophilia.**—Spasmophilia has been recognized as a clinical *entity only* for the past few years, since the method of *testing the muscles* for hyperexcitability *to the electric current has been in use.* Zybell reports twenty-nine cases in which *various dietetic* and therapeutic measures were tried. Two-thirds of the children were in their first year and half of them under 6 months of age. No special diet was found to have a uniform *effect on the* condition. The usual *practice* of keeping the *child* on starvation diet for twenty-four to forty-eight hours *he found* did more harm than *good.* He believes that spasmophilia is not due to a deficiency of calcium salts. Treatment with salts of calcium, *magnesium and* sodium had no effect. The only remedy that was found to have a uniform and pronounced beneficial effect was a solution of phosphorus in cod liver oil. Rosenstern recommends that in severe cases this be given in large doses—5 gm. five times per day of a solution of 0.01 gm. *phosphorus in 200 gm.* cod liver oil.

103. **The Sympathetic Nervous System and Intestinal Intoxication.**—Hirschfeld believes that the disintegration products of albumin metabolism circulating in the blood stimulate the sympathetic nervous system and bring about a condition of hypertonicity which manifests itself in the *clinical symptoms* of intestinal intoxication. He applied the epinephrin test of the eye in 265 cases, twenty of them with intestinal intoxication, and found it positive in all these twenty cases. He gives in brief nineteen case-histories showing the parallelism between the severity of the intoxication and the tonus of the sympathetic system.

105. **Cerebral Paralysis after Diphtheria.**—Dynkin describes two cases of unilateral hemiplegia following diphtheria, and gives an extensive review of the literature of the subject. These paralyses occur only after very severe forms of diphtheria. *In all cases physical signs of heart failure* are manifest, such as arhythmia, murmurs and dilatation. They occur mostly in the third or fourth week of the disease. A paresis of the facial and hypoglossus nerves and aphasia are generally observed in conjunction with them. In many cases there are also peripheral disturbances, such as paralysis of *the soft* palate and of accommodation, failure of patella reflex and incontinence of urine and feces. The cause of postdiphtheritic *hemiplegia* is generally an embolus from heart thrombosis: much more rarely thrombosis of the cerebral vessels.

Medizinische Klinik, Berlin

July 20, IX, No. 29, pp. 1149-1190

111 **Tuberculosis* of the Skin. (Behandlung der Hauttuberkulose.) J. Jadassohn.
112 *Dietetic Treatment of Gout. (Gicht.) A. E. Garrod.
113 Optic Neuritis with Neurofibromatosis. F. Pincus.
114 Conservative Treatment of the Tonsils. C. Kassel.
115 *Albumin Reaction in *Sputum in* Diagnosis of Tuberculosis. H. Schmitz.
116 The Urobilinogen Reaction in the Urine. O. Simon.
117 Chemistry of the *Protoplasm* and Nuclei of the Cell. R. Muschler.

111. **Tuberculosis of the Skin.**—Jadassohn has had *extensive* experience with roentgenotherapy, the *two-route treatment,* and all other *modern* methods *of treating* tuberculous

invasion of the skin, and has found roentgenotherapy remarkably effectual in many cases so that surgical measures have been more and more restricted of later years. But when the mucous membranes are involved, the actual cautery still seems to give the best results attainable. He is convinced that too timid dosage of the Roentgen rays has caused lupus cancer to be more prevalent than it would be without it. He insists in conclusion on the importance of practitioners recognizing tuberculous skin lesions when they first appear, so that treatment can be applied in time to render it promptly effectual. The ordinary skin diseases of children should be kept clean and healed up as soon as possible, and it should be borne in mind that everything useful in the prophylaxis of pulmonary tuberculosis has its place also in warding off tuberculosis cutis.

112. **Management of Gout.**—Garrod declares that the greatest progress in this line in recent years is the recognition of the important part played by uric acid in metabolism and the discovery that a diet can be arranged which is almost free from purins and yet contains plenty of albumin: milk, eggs and cheese are particularly useful on this account. But he emphasizes that the diet is not everything in the management of gout; moderation in all things, not merely in eating and drinking, is the golden rule by which the gouty are kept free from attacks. Avoidance of fatigue and of even the slightest trauma and everything liable to upset the precarious balance is the key to success. He had a patient develop an attack after mere removal of ear wax; another has an attack whenever he takes a long railroad ride.

115. **The Albumin Reaction in the Sputum.**—Schmitz examined the sputum from 100 patients and states that his findings sustain the importance of this welcome addition to our means of diagnosing pulmonary tuberculosis. He found albumin in the sputum in nearly every case of beginning pulmonary tuberculosis long before tubercle bacilli could be detected. At the same time the reaction was negative in some cases of manifest tuberculosis. The negative cases seemed to be those with a tendency to proliferating cicatricial changes, while albumin was present in all the cases of the inflammatory exudation type. (Application of the test for quantitative estimation was reported in The Journal, Oct. 26, 1912, p. 1537.)

Mitteilungen aus den Grenzgebieten der Med. und Chir., Jena

XXVI, No. 3, pp. 379-552. Last indexed July 12, p. 156

118 *Antipepsin in Blood Prevents Autodigestion of Tissues. (Zur Frage der Verdauung lebenden Gewebes im Magen, zugleich ein Beitrag zur Pathogenese des runden Magengeschwüres.) K. Kawamura.
119 *Neurotic Duodenal Ulcer. (Das neurotische Ulcus duodeni.) K. Westphal and G. Katsch.
120 *Aneurysm of Cerebral Arteries. (Hirnarterienaneurysmen und ihre Folgen.) A. Reinhardt.
121 *Artificial Respiration. (Ueber künstliche Atmung.) G. Liljestrand.
122 Sensitiveness of Visceral Organs and Abdominal Tissues in General. (Zur Frage der Sensibilität der Bauchhöhle.) M. Kappis.
123 *Roentgenoscopy of Uric-Acid Arthritis. (Die Arthritis urica im Röntgenbilde.) E. Jacobsohn.

118. **Why Living Tissue Is Not Digested by Its Own Juices.** Kawamura's research seems to establish the presence of an antipepsin in the circulating blood which prevents the gastric juice from digesting the stomach walls. Only when there is some interference with the blood-supply, shutting it off from a certain area, is the corroding juice able to exert its destructive action on the tissues. A gastric ulcer is thus primarily the result of shutting off part of the blood-supply from the wall of the stomach at this point.

119. **Neurotic Duodenal Ulcer.**—Westphal and Katsch report from von Bergmann's clinic at Altona thirty cases of duodenal ulcer confirmed by operation or necropsy, calling attention to the varying clinical picture in this material. The presence of the ulcer keeps up a constant irritation of the vegetative nervous system, and this may manifest itself at points remote from the actual seat of the ulcer. Most of the symptoms are the work of the secondary gastric neurosis, and the fluctuations in the neurosis are responsible for the objective findings and for some of the symptoms and subjective disturbances. The peculiar tenacity of the neurosis is due, they think, to the anatomic lesion which prevents the vegetative system from getting any rest or regaining its balance. Treatment should be directed against both the neurosis and the anatomic lesion. Atropin will aid in combating the neurosis by modifying the innervation; by thus aiding to correct the correlated neurosis, it will break into the vicious circle and, by setting the ulcer at rest, aid in its healing. Internal treatment along these lines is peculiarly beneficial when the stomach troubles are of purely neurotic nature and secondary to the duodenal ulcer. The treatment otherwise for both duodenal and gastric ulcers should be along the same lines, resting and sparing the organs as much as possible. The anatomic lesion may be combatted by direct surgical intervention or indirectly, by transforming the abnormal muscle functioning. By putting an end to the constant irritation from the ulcer, the vegetative nervous system will gradually have its balance restored and the neurotic symptoms will consequently subside. A direct operation on the ulcer is indicated only after failure of systematic and long continued internal treatment or when there is hemorrhage or perforation. The neurotic element in duodenal ulcer disturbances causes the clinical picture to vary in different cases so widely that it is more than probable that the primary ulcer has not been recognized in many such cases. The neurosis may affect the motor functioning or the secretory functioning. In the former, the clinical picture is that we are accustomed to with gastric hyperacidity; in the excessive-secretion form, the clinical picture is that of true Reichmann's disease. They compare two cases to illustrate these types: One had pain only when the stomach was being evacuated; the other the hunger pain exclusively at night. One had no vomiting; the other vomited frequently. One had constant tenderness at the "duodenal point;" the other never had tenderness here. One had moderate hyperacidity; the other extreme hyperacidity and parasecretion. The stomach in one was excessively tonic, with extreme hypermotility; in the other the stomach was hypotonic and stretched, with only weak peristalsis. The duodenum bulged in one; the pyloric region with the spasm of the pylorus in the other. The stomach in one hastily expelled its contents, at least at first, while the other patient had retention of stomach contents over six hours.

The distinguishing characteristics of the two types may be expressed by the terms "hyperperistaltic duodenal ulcers" and "maximal-secretion duodenal ulcers." The common features of the two types are that the patients have had gastrointestinal disturbances off and on for years, with periods of entire subsidence of all trouble; both have a circumscribed area of tenderness, one at Boas' right tender point and a history of tenderness over the duodenum although not to be elicited at present; the other with constant tenderness over the duodenum. Both have a tendency to hypersecretion in the stomach although with wide difference in the degree. Both have other signs of derangement of the vegetative nervous system, and in neither of the two typical cases contrasted above had there been any known bleeding. The operation first confirmed the presumptive diagnosis of a duodenal ulcer.

Much research work is being done at this clinic on the regulators of the intestinal tract and peptic ulcers of spasmogenic origin. Spasmodic contraction of the smooth muscle seems to be the cause of the pains with peptic ulcer and possibly may be the primary cause of the ulcer itself. A recess casting a shadow in the duodenum is not only pathognomonic of duodenal ulcer but it confirms that it has bored into the tissues. Another typical finding is the continuous retention of the bismuth suspension in the upper part of the duodenum, the *Dauerbulbus duodeni*, especially when the duodenum here is distorted. Almost every detail in the history and present status of a duodenal ulcer case occurs likewise with merely a gastric ulcer, confirming anew the importance of the element of neurosis. The thirty cases are analyzed in detail.

120. **Aneurysm of Cerebral Arteries.**—Reinhardt reviews ten cases, five in women between 30 and 58, five in men between

18 and 72. In four cases a congenital predisposition was evident and in three others probable; in two syphilis was responsible. The aneurysms were quite small except in one case in which the very large aneurysm simulated a malignant tumor in the sella turcica; it had induced symptoms for nine years, gradually growing more severe. At the operation the bleeding was assumed to be of the venous type owing to the anatomic conditions; the fact that an artery was involved was not recognized until too late.

121. **Artificial Respiration.**—Liljestrand reviews the history of artificial respiration and states that the results of rhythmic compression of the chest are not very encouraging. Better methods than this for artificial respiration are urgently needed; and he thinks that the pulmotor or Meltzer's method of intratracheal insufflation should be more generally available and applied. The rhythmic compression methods do not supply adequate ventilation for the lungs but may advantageously supplement the Meltzer method, at least.

123. **Gouty Arthritis.**—Jacobsohn gives a number of illustrations of the Roentgen-ray findings in eighteen cases of uric acid arthritis, all showing that the deposits have a destructive influence on the bone beneath. This suggests the advisability of removing gouty tophi to prevent further injury of the joint. In many instances roentgenoscopy alone cleared up the diagnosis when the clinical picture was apparently merely ordinary chronic rheumatic arthritis; in other cases the diagnosis of gout was not confirmed by roentgenoscopy. The findings with the latter should be weighed in connection with the metabolic findings.

Monatsschrift für Geburtshülfe und Gynäkologie, Berlin

XXXVIII, Supplementary No., pp. 1-408

124 Etiology of Atresia of the Vagina. (Zur Aetiologie der Gynatresien.) F. Thoma.
125 Use of Placentar Extract as a Lactagogue. (Zur Frage der Placentarhormone und der Verwendung von Placentarsubstanzen als Laktagoga.), F. Niklas.
126 *Treatment of Abortion. (Klinische und bakteriologische Beiträge zur Abortionstherapie.) E. v. Mihalkovics and E. Rosenthal.
127 Case of Prolapse of the Ureter Through the Urethra. (Ueber den Vorfall des Harnleiters durch die Harnröhre, nebst Bemerkungen zur Histologie des Oedema bullosum.) O. v. Franqué.
128 *End-Results of Obstetric Operations. H. Schröder.
129 *By-Effects of Hypophysis Medication. R. Hofstätter.
130 *Abnormal Size of Infants at Birth. (Zur Aetiologie des Riesenwuchses mit Berücksichtigung seiner forensischen Bedeutung.) A. Hübner.
131 Signs of Maturity in the New-Born Child. M. Kjolseth.
132 *Women in Industry and Women's Diseases. (Frauenerwerbsarbeit und Frauenkrankheit.) M. Hirsch.

July, XXXVIII, No. 1, pp. 1-124

133 Relation of Menstruation to Ovulation. (Neue Ansichten über die Menstruation und ihr zeitliches Verhalten zur Ovulation.) R. Schröder.
134 *Physiology of the Hypophysis. H. Schlimpert.
135 Serodiagnosis of Pregnancy. (Die Diagnose der Schwangerschaft mittels des Dialysierverfahrens und der optischen Methode.) E. Abderhalden.
136 Interruption of Pregnancy for Kidney Disease. (Schwangerschaft und Nierenleiden.) Schlayer.
137 Serodiagnosis in Obstetrics and Gynecology. T. Petri.
138 *Exophthalmic Goiter and the Genital Organs. A. E. Lampé.

126. **Treatment of Abortion.**—Mihalkovics and Rosenthal had 1,147 cases of abortion between Jan. 1, 1910, and June 30, 1912, with a mortality of 0.5 per cent., all being cases of beginning or incomplete abortion. In the last 100 cases bacteriologic examinations were made. They found microorganisms in every case, and in many cases several kinds. In all but one case there were pathogenic bacteria of some kind. In eighty-five cases staphylococci were found. They believe treatment should be based on clinical symptoms and not on bacteriologic findings; 875 patients were given active treatment and 272 expectant. Active treatment generally consisted in dilating the cervix with tampons and emptying the uterus with the finger; only in cases in which it was necessary, dilatation by Hegar's method and curetting. They prefer the active to the expectant treatment not only because it yields better therapeutic results but because it meets the economic needs of the patients by enabling them to return to their work sooner.

128. **Final Results of Obstetric Operations.**—Schröder found from a study of statistics for the years 1893-1905 at Bonn that of the children delivered by cesarean section and induced premature labor, fully one-half, possibly more, were dead before the end of the first fifteen months. This large mortality is partly due to the operation, partly to the fact that the economic situation of the parents is such that they cannot properly care for the infants, who need more than ordinary attention. Schröder believes that in view of this heavy mortality, of the hardships inflicted on parents and child, and the prolonged inability of the mother to work following the obstetric operation, it would in many cases be preferable to perform a mutilating operation on the child, unless the parents especially desire the maternal operation.

129. **Hypophysis Treatment.**—Hofstätter finds that except where overdoses have been given there have been no bad results from administration of hypophysis extract aside from some unpleasant, but not serious nervous manifestations. No injury to the kidney has ever been demonstrated. It should be given with caution to persons with uncompensated heart lesions or severe arteriosclerosis and to very nervous patients. The chief difficulty in its administration, he remarks, is that there is no standardized preparation which makes it possible to give an accurate dosage of the physiologically active substances.

130. **Abnormally Large Infants at Birth.**—Hübner says that infants over nine pounds in weight are born in over 3 per cent. of deliveries. A weight of over thirteen pounds very rarely occurs. He discusses at length the medicolegal bearing of the question as to whether abnormally long gestation can be given as a reason for the development of a large fetus. He concludes that the legal limit of 302 days safeguards the interests of illegitimate infants.

132. **Women in Industry and Women's Diseases.**—Hirsch calls attention to the increasing participation of women in industry in all countries. The percentage of women engaged in gainful pursuits varies from 42.8 per cent. in Austria to 8.4 per cent. in Russia. This entails on women the double burden of industrial labor and motherhood, to which is often added that of household work. He gives statistics showing the number of women engaged in various industries in Germany. Bad hygienic conditions and overwork affect women more severely than men. Among 10,000 working men from 25 to 34 years of age the yearly mortality was 492; that among an equal number of working women was 601, although the mortality for women in homes of the same social classes was about the same as for men. Tuberculosis is especially prevalent among women working in tobacco factories and printing establishments; also among workers in glass factories, from inhalation of dust. Anemia and chlorosis are frequent among workers in the textile trades and in all places where air and light are deficient. All these diseases have disastrous secondary effects on pregnancy and labor. Abortions are about seven times as frequent among employed as among non-employed women; premature births six times; placenta praevia, hemorrhage, pernicious vomiting and extra-uterine pregnancy two and a half times, pathological puerperium lasting more than thirteen weeks, five times.

Lead poisoning has a particularly active effect in producing abortions. It has been found in the organs of the fetus, and children of women working in lead show a special tendency to epilepsy, paralysis and hydrocephalus. Overwork also causes secondary diseases of the generative organs, especially in young girls who go to work at 13 or 14, at about the time menstruation is being established. Physicians, and more particularly women physicians, have before them the social task of seeing that the law provides adequate protection for women in industry.

134. **Physiology of the Hypophysis.**—Schlimpert tried to determine from experiments on cattle whether there was any change in the hypophysis during pregnancy. The essential principle of the gland does not seem to be present in greater

quantity in the pregnant than in the non-pregnant animal. It can be demonstrated in embryos of cattle at the tenth week by its vasoconstrictive action, and from the twenty-eighth week also by its effect on respiration.

138. Exophthalmic Goiter and the Genital Organs.—Lampé believes that Basedow's disease is caused by a disorder of the branchiogenous organs, including the thyroid, due to embryonic predisposition. This abnormal function brings about a secondary disorder of the genital glands, which are antagonistic to the thyroid in their action.

Münchener medizinische Wochenschrift

July 22, LX, No. 29, pp. 1585-1640

139 *Simple Technic for Phagocyte Index. (Zur Bestimmung des phagozytären Index und dessen klinische Bedeutung.) B. Stuber and F. Rütten.
140 *Compressive Treatment of Pulmonary Tuberculosis. (Ueber extrapleurale Pneumolyse mit sofortiger Plombierung bei Lungentuberkulose.) G. Baer. (Ueber Pneumolyse.) F. Jessen.
141 Improved Technic for Diagnostic Injection of Animals. (Tuberkulosennachweis im Tierversuch mit Hilfe der Pirquetschen Reaktion.) E. Conradi.
142 Serodiagnosis. (Experimentelle Untersuchungen über die Spezifität der proteolytischen Abwehr- — Schutz- — fermente, Abderhalden. II.) E. Frank, F. Rosenthal and H. Biberstein.
143 Paroxysmal Tachycardia; Fifteen Cases. K. Grassmann.
144 Dressing for Fracture of the Clavicle. (Zur Behandlung des Schlüsselbeinbruchs.) N. Kaefer.
145 Lesions of the Cornea after General Anesthesia. (Hornhautläsionen nach Narkosen.) O. Schnaudigel.
146 Distillation of Water. A. G. Barladean.
147 Paper Mask. (Gesichtsschutzvorrichtung aus Papier.) Levinger.

139. The Phagocyte Index.—Stuber and Rütten remark that the opsonic count has not made much headway in Germany; there is a general distrust of the hypothetic opsonins while the technical difficulties are great. They have worked out a very simple method for the phagocyte count which throws light on the vital functional capacity and behavior of the leukocytes. Instead of trying to determine the phagocytic capacity of the leukocytes in regard to the special germs responsible for the trouble in the individual case, they sought to determine the vital capacity of the leukocytes in the individual case as tested with a standard object to be phagocyted. After many tentative experiments they found the spores of the thrush fungus, *Oidium albicans*, apparently the best adapted for the purpose. It is cultivated on glycerin-agar with 0.25 or 0.5 per cent. eosin on which it develops without filamentous threads, running only to spores during months of cultivation. A culture of this fungus is suspended in an artificial serum (7.5 c.c. sodium chlorid; 6 c.c. sodium citrate and distilled water to 1,000 c.c.). The leukocytes are liable to clump unless there is some homogeneous serum or ascitic fluid present or other solution of albumin. They found a saturated aqueous solution of egg albumin best for the purpose. In a centrifuge tube are placed 0.1 c.c. of the artificial serum; 0.1 c.c. of the ovalbumin solution; 0.03 c.c. of the suspension of the thrush fungus, and 0.03 c.c. of the blood to be examined. The contents of the tube are well mixed with a platinum needle and the tube is then kept for forty-five minutes at 37 C. It is then centrifuged for one minute with about 800 turns. Most of the red corpuscles are then in the tip of the tube, above this comes a layer of leukocytes, and above this the serum. The serum is then aspirated out: the long drawn out tip of the tube, containing the red corpuscles, is then broken off. The leukocytes are thus left in the tube and they are easily blown out on an object glass and stained by Leishman's technic. The thrush fungus spores take a bright blue and are encircled with a white halo. They count the number of spores in 200 leukocytes; with normal phagocytes there will be 200 spores in 200 leukocytes, so the index will be $\frac{\text{Number of spores}}{\text{Number of leukocytes}} = 1$. This is the standard index in health. The individual index is the $\frac{\text{Patient's index}}{\text{Normal index}} =$ Phagocytic Index. The whole technic is thus extremely simple and in the cases cited the low index at the height of the disease and its gradual rise during convalescence amply demonstrate how the phagocytic index mirrors the capacity and power of the organism to combat invading infection. Among the important information which it affords may be mentioned the differentiation of gastric ulcer from gastric cancer as the phagocytic index shows that the organism is not depressed by malignant disease. The index varies in health from 0.8 to 1.2; when it is merely 0.5 the defensive forces are evidently at a low ebb. Of course it is a delicate biologic reaction, and it is necessary to test the fungus spores occasionally with normal blood to detect degeneration.

140. Compression of the Lung by Separating it from the Chest Walls with or without Filling up the Space Left.—Baer and Jessen each present a contribution to this subject, reporting clinical experience which encourages further work in this line. Baer's method is to detach the pleura from the ribs and fit into the extrapleural space thus made a paraffin filling. For each 75 c.c. of paraffin with a melting point at 58 C., he adds 25 c.c. of paraffin melting at 50 C. and 1 gm. bismuth and a little mild disinfectant. This is thoroughly blended and with a knife chunks of the jelly-like mass are fitted into the extrapleural space and the skin is sutured at once. He has thus treated two patients, as he describes at length with the necropsy findings in one who had fatal tuberculous meningitis seven weeks afterward. The cavities were found entirely obliterated and scarcely recognizable. The experiences related seem to demonstrate the harmlessness of the method in comparison with resection of ribs; the necropsy findings show that the filling heals without inflammation. There is no danger of aspiration while expectoration was promoted from the very first, and the amount of sputum dropped from 150 to 50 c.c. and from 130 to 15 c.c. in a remarkably short time. There is merely a linear scar left while the chest retains its normal outline. The great advantage of Baer's technic is that the compression by the extrapleural pneumolysis and filling is applied exactly at the point where it is needed, not over the whole lung as with an artificial pneumothorax with which the sound parts of the lung as well as the diseased are compressed.

Jessen reports similar experiences only he found in the course of the six cases in which he has applied pneumolysis that the filling is not necessary; the desired results are attained without this. Adhesions sometimes interfere with the success of the pneumolysis, just as with making an artificial pneumothorax, but when it succeeds the effect is as good as with excision of ribs without the shock of the latter and the resulting disfigurement. If the lung can be detached sufficiently more or less all around no filling is necessary. If a filling is required he prefers a mixture of equal parts of white wax and white vaselin, with 0.5 per cent. magnesium carbonate and salicylic acid; this is absorbed more slowly than Baer's paraffin mixture, he says. A piece of a rib is resected and the finger is worked between the periosteum and endothoracic fascia and the lung detached. In his first case a young man had a cavity in each upper lobe with pleuritic adhesions. After resection of 3 cm. of the second rib on the left side, the apex and upper lobe down to the fourth rib were detached and 200 c.c. of the wax-vaselin filling injected. No effect on the sputum was observed. Three weeks later the lung on the other side was detached except for a cord-like adhesion fastening it to the first rib. No filling was injected on this side, but at once the sputum dropped from 50 c.c. to 10. In another case 300 c.c. of paraffin were injected after the pneumolysis; the eighth day the region protruded and the paraffin was forcibly expelled, with fluid, the whole resembling a delivery. There was no febrile reaction, the parts soon healed, and the sputum dropped from 50 c.c. to 15 and the patient seemed transformed, all toxic symptoms subsided and roentgenoscopy shows the large cavity collapsed as completely as after thoracoplasty. Two other cases show that adhesions may interfere to prevent a favorable outcome, and resection of several ribs to mobilize the chest wall may be the only resource. In all the cases there was a rise in temperature after the pneumolysis, the manipulation of the lung evidently forcing toxins into the circulation.

Wiener klinische Wochenschrift, Vienna

July 24, XXVI, No. 30, pp. 1233-1264

148 *Biologic Test for Progressive Paralysis. (Eine diagnostisch verwertbare Reaktion in der Spinalflüssigkeit von Paralytikern.) H. Maruyama.
149 Skin Reaction after Injection of Colloidal Metals. (Ueber allergieähnliche Erscheinungen an der Haut nach Einverleibung von kolloidalen Metallen.) R. Hift.
150 Serodiagnosis of Exanthematous Typhus. (Zur serologischen Diagnose des Flecktyphus.) Markl.
151 Magnesium Salts and Calcium-Precipitating Salts Neutralize Certain Poisons. (Die pharmakologische Wirkung von kalziumfällenden Säuren und Magnesiumsalzen.) E. Starkenstein.
152 Obesity as Result of a Basophil Adenoma in the Hypophysis. (Zur Frage der Adipositas hypophysarea.) T. Bauer and H. Wassing.
153 Central Dislocation of the Femur. M. Haudek.

148. **Biologic Test for Progressive Paralysis.**—Maruyama found that guinea-pigs injected two or three weeks before with 0.02 c.c. of human blood-serum died in a few minutes with symptoms of anaphylaxis after an intravenous injection, for each 100 gm. of body weight, of 1.5 to 2 c.c. of the cerebrospinal fluid from a person with progressive paralysis. No effect or but insignificant effect followed when the fluid was derived from patients with other nervous or mental affections.

Zeitschrift für Kinderheilkunde, Berlin

VIII, No. 3, pp. 187-290

154 Determination of Calcium Content of the Blood in Children by Wright's Method. M. Katzenellenbogen.
155 Diagnosis and Treatment for Oxyuris Vermicularis. Trumpp.
156 The Iso-Electric Points of Human Milk and Milk of Various Animals. (Der isoelektrische Punkt des Menschen-, Kuh-, Ziegen-, Hunde- und Meerschweinchen- Milchcaseins.) A. Yippö.
157 Metabolism in Dyspepsia and Intestinal Intoxication. I. Jundell.

Zentralblatt für Chirurgie, Leipsic

July 26, XL, No 30, pp. 1169-1208

158 Ligation of Pylorus with Strip of Fascia Plus Pyloropexy: Two Cases. A. Hofmann.
159 Aseptic Enterostomy. A. Wolff.
160 Improved Technic for Radical Operation in Two Sittings for Cancerous Stenosis of the Sigmoid Flexure. M. Madlener.
161 Fascia Lata Patch for Resection of the Liver. B. Chessin.

Zentralblatt für Gynäkologie, Leipsic

July 26, XXXVII, No. 30, pp. 1101-1140

162 Technic for Bathing the New-Born Infant. (Ueber das Baden der Neugeborenen.) F. Weisswange.
163 Cesarean Section Done by the Pregnant Woman Herself. Fourth Case on Record. Smooth Recovery Shows Resisting Power of the Peritoneum. (Zur Widerstandskraft des Peritoneums und der Uterusnaht nach Sectio caesarea—von der Patientin selbst ausgeführt.) R. Patek.

Zentralblatt für innere Medizin, Leipsic

July 26, XXXIV, No. 30, pp. 753-776

164 Uric Acid in the Saliva. (Vorkommen von Harnsäure im normalen und pathologischen Speichel.) E. Herzfeld and A. Stocker.

Gazzetta degli Ospedali e delle Cliniche, Milan

July 13, XXXIV, No. 83, pp. 855-870

165 Torsion of the Omentum. R. Cinaglia.

July 15, No. 84, pp. 871-878

166 *Diagnostic Puncture of the Lung in Pneumonia. A. Bertolini.

July 17, No. 85, pp. 879-886

167 Influence of Hypophysis Extract on Elimination of Hippuric Acid. A. Farini and B. Ceccaroni.

July 20, No. 86, pp. 887-902

168 Hernia of the Stomach. (Ernia epigastrico dello stomaco.) C. Mantelli.

July 22, No. 87, pp. 903-910

169 Cancer of the Thymus in Man of 50. (Neoplasma del timo con sindrome di mielite transversa da metastasi vertebrali.) Roccavilla

166. **Puncture of the Lung in Pneumonia.**—Bertolini declares that cautiously done it is a simple and harmless matter to puncture the morbid focus and thus verify the bacteriologic diagnosis and obtain material for vaccine therapy. The findings show the state of the process and its gravity. The method has been extensively applied in Italy and he tabulates here the details in twenty-nine cases of pneumonia and three which proved to be merely bronchitis. Large numbers of diplococci in the fluid are a bad sign. The findings were constantly negative during the crisis and afterward. The needle must not be introduced near the hilus and only in the seventh, eighth or ninth interspace, front or rear, as otherwise it is liable to injure a vessel. From the front it can further be introduced in the second or third space. No trace of injury from the needle or even of its passage was detectable in the lungs after death.

Policlinico, Rome

July 20, XX, No. 29, pp. 1029-1064

170 Identity of Kala-Azar in Man and Dog. (I recenti studi sull' identita della leishmaniosi umana e canina del Mediterraneo.) C. Basile.

July 27, No. 30, pp. 1065-1100

171 *The Urea Index with Kidney Disease. (La constante uremica di Ambard o il coefficiente ureo-secretorio per la valutazione della funzionalita renale.) A. L. Bonanome.

171. **The Urea Index with Kidney Disease.**—Ambard's formula was given in The Journal, July 20, 1912, p. 229, and Sept. 7, 1912, p. 818. Bonanome regards it as an important aid in estimating the functional capacity of the kidneys. To obtain the maximum information from it, he says, it should be associated with Martinet's pulse-kidney coefficient and Albarran's method of experimental polyuria. (Martinet's functional index was described in The Journal, Jan. 18, 1913, p. 248, and the experimental polyuria test Jan. 4, 1913, p. 90.) The insight into kidney functioning afforded by these various tests is truly remarkable, Bonanome states, and illustrates by a few concrete examples.

Riforma Medica, Naples

July 12, XXIX, No. 28, pp. 757-784

172 Cysts from Absence of Vas Deferens. Two Cases. (A proposito di due casi di cisti spermatica con assenza del dotto deferente.) G. de Francisco.

July 19, No. 29, pp. 785-812

173 Influence and Action of Epinephrin in Muscular and Mental work. (L'adrenalina nel lavoro muscolare ed intellettuale.) V. Palmulli.
174 Dystrophy from Defective Internal Secretions. (Distrofia endocrino-simpatica: ipogenitalismo con emilipomatosi diffusa della cute.) C. Bartolotti.

Brazil Medico, Rio de Janeiro

July 8, XXVII, No. 26, pp. 259-270

175 Technic, Indications and Advantages of Direct Transfusion of Blood. C. Werneck. Commenced in No. 25.

Semana Medica, Buenos Aires

June 26, XX, No. 26, pp. 1477-1536

176 Treatment of Chronic Nephritis Based on Modern Tests of Kidney Functioning (Nuevos conceptos del mal de Bright.) J. M. Cabezon.
177 Continuous Digitalis Medication. (La *digitaloterapia* cronica.) M. F. Castex.
178 Artificial Plasmogenesis. (Los comienzos de la vida. El *reino protobial.*) V. Delfino.
179 Treatment of Pseudarthrosis by Bone Autoplastic Operation. H. F. Lista.

July 3, No. 27, pp. 1-60

180 Congenital Defect of the Heart. (Caso di vicio congenito del corazon. Persistencia del orificio de Botal con estenosis de la pulmonar.) L. Orioli.
181 Ergot. (Cornezuelo de Centeno. Sclerotium clavus DC.) J. A. Dominguez.

Ugeskrift for Læger, Copenhagen

July 24, LXXV, No. 30, pp. 1247-1290

182 Study of the Antiproteolytic Substances in the Blood During Pregnancy. (De antiproteolytiske Stoffer i Blodet under Svangerskabet.) S. A. Gammeltoft.

The Journal of the
American Medical Association

Published Under the Auspices of the Board of Trustees

Vol. LXI, No. 10 Chicago, Illinois September 6, 1913

EPIDEMIC STREPTOCOCCUS SORE THROAT —ITS SYMPTOMS, ORIGIN AND TRANSMISSION *

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Epidemics of streptococcus sore throat have recently sprung up as a scourge, so new that they receive no mention even in the latest editions of our text-books.

Within two years three extensive and alarming epidemics have occurred, which have no counterpart in American medical history. In some respects they call to mind the first severe invasion of influenza, but the latter disease spread everywhere throughout the country, whereas each of the streptococcus sore throat outbreaks was confined to a single community.

It is quite probable, however, that many of our local tonsillitis epidemics, loosely designated as "grip," have in reality been due to streptococcus.

In England comparatively small outbreaks of "septic sore throat" have been described[1] in seventeen localities, and a probable relationship to the milk-supply has been recognized; but in few instances were careful bacteriologic investigations carried out. The streptococcus was first demonstrated in cultures obtained from cases of sore throat in Finchley (1904), where 550 persons were attacked. The *Streptococcus pyogenes* was first detected in the suspected milk in the Guildford outbreak (1903). The following year in the Colchester epidemics, claiming 600 victims, the streptococcus was obtained both in the throat exudate and in the milk. This organism was likewise recovered from the throat and the milk in the Christiania epidemic of 1908, in which 548 persons fell a prey to the disease.

The existence of mastitis in the cows was noted in all four of these foreign outbreaks.

The American epidemics of streptococcus sore throat were carefully studied from a clinical and bacteriologic point of view, and many new facts bearing on the etiology were brought to light. A brief summary of the salient features of these outbreaks may be profitable.

Extent of Epidemic.—About 1,400 persons were stricken in the Boston outbreak, and of this number 1,043 were investigated. In Baltimore about 1,000 were affected and 602 recorded. The total in Chicago was estimated to be over 10,000, though only 1,271 were studied.

The Organism.—In all three cities a peculiar type of hemolytic capsulated streptococcus was secured from throat cultures or from the peritoneal exudate of fatal cases. Davis compared cultures from each outbreak and found them practically identical.

Season.—The cases appeared in the winter and spring months, occurring in Chicago during the last of December and in January, in Baltimore during March, and in Boston during May.

Explosive Outbreak.—A sudden appearance of a large number of cases was characteristic of each epidemic. Often several members of a household were taken ill almost at the same time, suggesting a common source of infection rather than dissemination by personal contact.

Clinical Symptoms.—The sore throat manifestations were similar in all epidemics. Intense hyperemia with or without a grayish exudate was the usual picture.

Enlargement of the cervical lymph-nodes was one of the most characteristic symptoms, occasionally resulting in suppuration. Extreme prostration and a tendency to relapse were emphasized by most observers.

The three epidemics reveal a striking similarity in the complications. Otitis media, peritonsillar abscess, erysipelas or some other form of skin eruptions and nephritis were common sequels. Arthritis, endocarditis and myocarditis occurred in many cases. Pleurisy and pneumonia often ushered in a fatal septicemia. But the most dangerous and remarkable complication was peritonitis, which was responsible for a great number of deaths.

Relationship to Milk.—The infection was traced definitely to a single milk-supply in every city. The sore throat cases traced to one dairy made up 70 per cent. of the total in Boston, 65 per cent. in Baltimore and 72 per cent. in Chicago. As the suspected dairy in each instance supplied only a small proportion of the city consumption, these percentages become highly significant. There is no doubt that secondary cases developed by means of contact, but it quite overturns our accepted theories of transmission to observe that the secondary contact cases were few compared with the number of cases directly infected by the use of milk.

As this fact was established in all the epidemics we must in the future revise our notions concerning the importance of contact in the dissemination of streptococcus infections.

Ultimate Sources of Contamination.—The indictment in each of the epidemics against a single dairy as the carrier of the germs was so strongly supported by clinical facts as to be final and conclusive.

The evidence submitted to show when and how the milk became infected may be considered under the following classification:

1. Streptococcus in the mixed milk at the collecting plant or at the farm.
2. Mastitis in cows, from whose udders streptococcus is directly obtained.
3. Streptococcus sore throat in the milkers.

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* Read in the Section on Pathology and Physiology of the American Medical Association, at the Sixty-Fourth Annual Session held at Minneapolis, June, 1913.

[1] Savage, W. G.: Milk and the Public Health, Macmillan & Co., London, 1912

4. Streptococcus sore throat in other employees who handle the milk.

In his study of the Boston epidemic, Winslow[2] found no evidence of cattle disease and no well-defined cases of sort throat in a milker. He did discover, however, cases of sore throat in employees at the farm and dairy. The actual infection he attributed to a human carrier.

Stokes[3] succeeded in obtaining more definite information in the Baltimore outbreak. He found the streptococcus epidemic in the raw mixed milk of one herd but could not trace the infection to the cow. There was no history of septic sore throat cases among the farmers or employees. Although final proof was lacking, Stokes expressed the belief that the infection originated in the cows.

Investigations in the Chicago epidemic revealed the *Streptococcus pyogenes* in the milk obtained directly from the inflamed udder of the cow and also in cultures taken from a milker with sore throat. A history of septic sore throat among employees was also established.

Direct contamination of the milk by human carriers does not offer a satisfactory explanation of these epidemics, because such a contamination is likely to be casual and occasional, whereas the outbreaks indicate a continuous infection for a few weeks. Furthermore, the amount of infectious material introduced by a human carrier in coughing, etc., is relatively small to produce such appalling results.

A mastitis infection with streptococcus, on the other hand, would entirely explain the continuous stream of milk contaminated with enormous numbers of organisms.

A comparison of the American epidemics does not indicate at first glance that the source of infection was the same, because mastitis was not found at all in the Boston herds, and only a non-pathogenic form of garget was discovered in Baltimore.

These apparent discrepancies, however, may be cleared up by recent investigations. Davis[4] has succeeded in producing in the udder of a healthy cow an infection with a human strain of *Streptococcus hemolyticus*. The germs, introduced through a slight abrasion of the teat by the contaminated hand in the act of milking, caused an ascending infection of the teat and udder, characterized by the presence of pus and myriads of streptococci that persisted for two or three weeks. Strange to say, there was no caking of the bag. We cannot therefore place any dependence on caked bag as a necessary accompaniment of mastitis. Streptococcus mastitis without caking may well have existed in some of the cows in the Boston or Baltimore herds and yet have escaped detection.

In the future, it will be necessary to examine the milk from each cow in a suspected herd for pus and streptococci.

I believe that streptococcus mastitis will be recognized as the most important source of extensive epidemics of septic sore throat. That the mastitis may originate by transmission of human streptococcus through the medium of the milker seems to be established. Whether or not mastitis due to a specific bovine streptococcus may become virulent to man is a problem yet to be determined. When we come to a consideration of prophylaxis all other measures and precautions sink into insignificance when compared with thorough pasteurization. A general enforcement of pasteurization would put an end to a malady that otherwise promises to be one of the most formidable and wide-spread of the infectious diseases.

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CHRONIC STREPTOCOCCUS ARTHRITIS*

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The relation of streptococci to arthritis is a very broad one. The highly acute purulent inflammation of joints which may be simply part of a general streptococcus pyemia or septicemia is well known and fairly well understood. It occurs in connection with severe streptococcus infections, such as puerperal fever, infected wounds, erysipelas and common infectious diseases. Of the latter I shall mention especially septic sore throat as it has been observed by Capps and others in connection with milk-borne epidemics. In all of these there is a tendency, at times not very marked, but at other times striking indeed, for the streptococci to produce arthritis.

The tendency on the part of streptococci to localize in joints of experimental animals seems to concern the several varieties, though to an unequal extent. The common hemolytic streptococci and the *Streptococcus mucosus* readily attack joint cavities; the *Streptococcus viridans*, on the other hand, rarely does so. The *Diplococcus rheumaticus* is also very prone to attack joints as shown by Poynton and Payne, Beattie, and especially by Rosenow's recent work. The streptococcus found in septic sore throat, which appears to be a highly virulent variety of the hemolytic streptococcus, readily produces multiple arthritis in animals with often other lesions such as endocarditis, pericarditis, myocarditis, peritonitis, etc. This agrees with the occurrence of the serious complication in human beings observed during these milk-borne epidemics.

The subacute or chronic types of arthritis leading toward some permanent change in the joint or periarticular structures form a large and miscellaneous group of joint disorders, and their classification is as yet imperfect and unsatisfactory. "Arthritis deformans" is, perhaps, the term most commonly applied to them. Their etiology is undoubtedly manifold and they probably furnish an illustration in which similar and often indistinguishable pathologic changes and clinical symptoms are brought about by widely different agents. From this large group in recent years, however, certain smaller groups have been separated; for example, traumatic arthritis deformans and certain cases of gonococcal arthritis. In other words, as soon as the true etiology of a case, or group of cases is discovered it is removed from this large group of arthritis deformans to a class or group designated by its etiologic agent.

In this paper I wish to discuss chiefly from an etiologic point of view a certain group of these cases of chronic arthritis or arthritis deformans whose cause can with fair definiteness be attributed to a streptococcus infection, usually though not always originating somewhere about the upper respiratory passages. I believe that it is often possible to separate these cases clinically and especially by the history from deforming arthritides of other origin. Etiologically also I believe that these cases can and should be at present placed in a group by themselves and removed from the larger and more miscellaneous group of arthritis deformans.

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[2] Winslow, C. E. A.: An Outbreak of Tonsillitis or Septic Sore Throat in Massachusetts, and Its Relation to an Infected Milk-Supply, Jour. Infect. Dis., 1912, x, 111.

[3] Stokes, W. R., and Hachtel, F. W.: Septic Sore Throat, a Milk-Borne Outbreak in Baltimore, Pub. Health Rep., 1912, No. 103, p. 44.

[4] Davis, D. J.: Communication read at the American Society for Clinical Investigation, Washington, D. C., May 5, 1913.

* Read in the Section on Pathology and Physiology of the American [illegible] at the Sixty-Fourth Annual Session held at [illegible]

* From the Pathological Laboratory of St. Luke's Hospital, Chicago.

The clinical symptoms of these cases, though often indefinite, still possess certain features which are more or less characteristic. It has been common to speak of an acute and a chronic form or type of deforming arthritis. This is done, for example, by McCrae in his excellent article on this subject in Osler's "System of Medicine." The chronic form in general tends to progress slowly and gradually without definite exacerbations or recurrences. The more acute or subacute form often has a rather sudden onset with some fever and involvement frequently of several joints. Such attacks tend to subside and recur, often closely resembling acute articular rheumatism, with which I believe it is not uncommonly confused in the early stages. The joints may be red, swollen, painful and tender; or the attacks may be light and the patient may experience only slight and transient pains and perhaps some stiffness in the joints. In contrast with acute rheumatic fever, salicylates have little or no effect, especially early in the disease.

The striking feature in these cases, however, is the persistence of the symptoms and the tendency to more or less permanent change in the joints. This is the chief differentiating feature from acute rheumatic fever. Not uncommonly heart murmurs and distinct endocarditis may develop in these cases during or following the recurrences. In common with acute articular rheumatism is the fact that the attacks and exacerbations are often preceded or appear simultaneously with an attack of tonsillitis or pharyngitis. An infecting focus may appear in other parts of the body, but the pharyngeal ring seems to be by far the most common atrium.

The history of tonsillitis in these chronic cases just preceding or simultaneous with the onset is of great importance in the diagnosis and may be sufficient in itself to determine how the case should be managed. I wish again to emphasize, however, that border-line cases are common and it is difficult or impossible at times to determine whether or not they belong to this group. Furthermore, the occurrence of a focus such as diseased tonsils or infected teeth and arthritis in the same person does not necessarily mean that the processes are directly related. They may or may not be.

A report[1] has already been made on the bacteriologic and pathologic study in some of these cases, and here I wish to present further data more especially on points which concern the specificity of streptococci as causative agents.

I have had an opportunity to make observations in forty-two cases which I think may be placed in this group of arthritides and in which the atrium of infection appeared to be in diseased tonsils. Other cases of chronic arthritis have been observed and studied in which the atrium apparently was in other locations, such as the teeth, urinary tract, etc., but these I do not wish to consider at this time. In all the cases with one or two exceptions the tonsils were removed and cultures made from the crypts. From thirty-eight a hemolytic streptococcus was grown and in the great majority in practically pure cultures. A point that I wish to call especial attention to is the occurrence of these cocci in the crypts often to the exclusion of other bacteria. To demonstrate this, careful cultures must be made from the depths of the crypts after the tonsil has been incised with a sterile knife. Surface cultures or cultures made from badly lacerated tonsils give usually many buccal cocci chiefly of the *Streptococcus viridans* type.

In some of the patients joint effusions appeared at some time during the course of the disease. In four patients careful examination of the aspirated fluid in smears and cultures revealed no bacteria of any kind. Leukocytes were few in number. Blood-cultures made in ten cases did not yield positive results. These data are in agreement with the reports of many other workers on this subject. This does not mean that bacteria may not be found at times in the blood or that the bacteria may not be constantly present in or about the joints. As animal experiments show, the exudate especially in old joint lesions is often sterile so far as cultures indicate. On the other hand, smear preparations carefully made may show a few cocci.[2]

The tonsils in these cases may or may not be enlarged. While usually they are somewhat hypertrophied, often they are small and at times submerged. The latter are dangerous because they are easily overlooked. Proper drainage in such organs is naturally interfered with. The color is often diffusely red or bluish-red; at times large hyperemic areas appear. On slight pressure there may be a purulent exudate from the crypts consisting of pus cells and diplococci. It should be stated also that in some patients there is nothing in the appearance of the tonsil to make one suspect a pathologic condition. In a number of cases the tonsils had been at some previous time only partially removed or sliced off with a tonsillotome. Such operations are not only not effective but are positively harmful on account of the formation of fibrous tissue at the cut surface which tends to occlude the crypts and prevent drainage.

Microscopic examination of the tonsils usually reveals clusters of polynuclear leukocytes in the crypts and especially in the epithelium lining them. At times infected foci occur beneath the epithelium and small abscesses may appear in the tissue. The blood-vessels may be hyperemic, and plasma-cells about vessels and beneath and in the epithelium are always present.

The streptococci cultivated from the diseased tonsils have been carefully studied. Not all are identical, but they evidently belong to the general group of hemolytic streptococci.

Most of these organisms have a moderately wide, clear zone of hemolysis on blood-plates, though there is considerable variation in the width of zone. The colonies are small and gray and have little tendency to spread. They are not mucoid or watery, and the cocci are not encapsulated. They do not ferment inulin, and some ferment mannite and others do not. None ferment raffinose and their reaction on lactose is not constant; most of the strains ferment it; a few do not.

Some of the streptococci found in certain cases have a much narrower zone of hemolysis which also may be slightly grayish or turbid. The margin is less distinct and the colony smaller. The difference between this and the first streptococcus mentioned is sufficient to enable one to separate them, especially when they occur on the same plate. Morphologically the cocci are perhaps slightly smaller and as a rule, though not always, form shorter chains than the other streptococci. They may produce arthritis when injected into animals in large doses, but they are as a rule not highly virulent. They were found in a number of cases associated with the more hemolytic variety and sometimes they appeared practically pure. While often the differentiation of the two kinds is clear this is not always so, and not infrequently intermediate or transition forms were seen.

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[1] Davis: Jour. Infect. Dis., 1912, x, 148.

[2] A careful study is now being made both in animals and in man with a view to clear up the point as to the presence of cocci in or about chronic arthritic joints. A hemolytic streptococcus has already been cultivated from the synovial membrane obtained from a case of chronic arthritis in which Dr. McArthur operated. This organism readily produces arthritis in rabbits.

When the streptococci are injected in sufficiently large doses (one or two blood-slants) intravenously into young rabbits, they invariably localize in or about the joints, producing as a rule multiple arthritis. This condition has been produced in over two hundred animals. In a sense the cocci are not highly virulent, large doses (several tubes) being necessary to kill guinea-pigs by intraperitoneal injections. The joints most commonly affected in the animals are the wrists, phalanges, knees and ankles, though practically every joint in the body is at times involved. The infection in the joints usually appears a few days after inoculation and continues for from one to three weeks or longer. Relapses may occur. Not infrequently the changes in the joints become chronic with considerable deformity, and with the formation of exostoses, lipping of margins and other hyperplastic changes. At times such animals live for many months, becoming badly deformed and crippled and ultimately dying in an emaciated condition.

Early in the course of the infection in these animals, cultures from the joints usually yield streptococci. They tend to disappear and at times even after the second or hird day no growth may be obtained. In the chronic oints after weeks or months the streptococci may still e found in the exudate, though often they are not. The xudate early is slimy, mucoid and glairy, later becomng more purulent. In very old joints it may be gelatnous in character.

In about 10 per cent. of the animals so inoculated definite endocarditis results. Also occasionally a ibrinous pericarditis is seen (observed five times). A areful histologic study of these joints and the heart esions have been made by Dr. Leila Jackson[3] in the athologic laboratory of St. Luke's Hospital. In the eart muscle Jackson often finds focal lesions consistng of clusters of round cells and, in older lesions, of eculiar large giant-cells. In these nodules cocci may e found especially early, in large numbers. A striking eature of these lesions is the relative absence of a egional leukocytic infiltration. Jackson likewise finds eculiar and characteristic nodules in the periarticular tructures and in the synovia. The bacteria enter the oint cavities as early as ten hours after intravenous njection apparently from the rich meshwork of synovial apillaries in the lateral plicae. In the ends of the ones, especially about the epiphyseal cartilages, at imes definite infarcts due to bacterial emboli are seen extending toward the joint, usually subjacent to the periosteum. These experimentally produced lesions in animals bear certain resemblances to lesions described by other writers in the heart and joint structures of man in cases of acute rheumatic fever.

It should be pointed out that hemolytic streptococci may occur in the crypts and on the surface of tonsils not only in ordinary streptococcus tonsillar infections but also in normal tonsils. These streptococci often cannot be distinguished from the streptococci found in the tonsils of those patients suffering with joint trouble. Consequently the presence of streptococci in cultures should be carefully interpreted. They may or may not be significant, just as finding pneumococci in the throat or sputum may or may not be significant for the diagnosis of lobar pneumonia.

I shall refer to the therapeutic side of this subject largely on account of its bearing on the etiology as manifested by the "constitutional reactions" following extirpation of infected foci and the administration of autogenous vaccines. In this group of forty-two cases there was an opportunity to follow nearly every patient for a considerable period of time. As generally conceded now by those who have had most experience, the value of focal extirpation is unquestioned. The observations of Dr. Billings, who saw many of the cases here reported, may be referred to. In nearly every patient in this series marked improvement appeared and often complete cure resulted from the enucleation of the tonsils. The recovery was gradual as a rule. Naturally marked bony ankylosis and extensive fibrous change could not be essentially altered or modified. In about one half of the cases vaccines were prepared from the streptococci isolated from the infected focus. On the whole, the progress of cases so treated seems to indicate that the improvement is hastened by the use of these vaccines.

In some patients the vaccines acted like a specific. As an illustration let me cite an instance. A patient (case of Dr. Arthur Elliot) had suffered for the past three months with severe and progressive arthritis involving many joints of both upper and lower extremities and certain vertebral joints. The trouble began with an attack of sore throat and simulated in some respects acute articular rheumatism. Blood-culture was negative, leukocytes 11,400. The tonsils were removed and found pathologic. Cultures carefully made from the crypts of both tonsils gave an absolutely pure growth of hemolytic streptococci. An autogenous vaccine was prepared and 200 million were given in the first dose. Eight hours later the patient reacted rather sharply and severely. He felt chilly and there was a degree or two of fever. All the involved joints became distinctly more tender and some were swollen. This condition lasted for about two days, and then subsided rather rapidly. With this there was marked improvement in the patient's condition. At five-day intervals three doses of vaccine were given and in about two weeks or less the joints had assumed almost their normal condition.

In a number of instances this prompt reaction or hypersusceptibility after relatively small doses of dead autogenous streptococci has been noted, and it corresponds undoubtedly with the reaction that has been observed in other infections, for example, by Irons in gonorrheal arthritis after injections of gonococci. Not all cases by any means show it. I think that in those that do the improvement on the whole is more prompt and rapid. Attention is here called to the fact that this reaction would seem to be conclusive proof of the specificity of the streptococcus in such arthritides.

Another point of interest is that in three instances acute attacks or exacerbations followed the tonsillectomy almost immediately. This phenomenon has been noted occasionally by many observers and is undoubtedly due to a dissemination in the circulation of infectious material by the operation. This is another argument in favor of the arthritic process being infectious and located primarily in the tonsils.

The value of vaccines was also demonstrated in one case in which it was impossible to remove the diseased tonsils on account of high blood-pressure. The man had a very serious chronic polyarthritis for nearly a year.

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[3] Jackson, Leila: Experimental Rheumatic Myocarditis, Jour. Infect. Dis., 1912, xi, 243. Experimental Streptococcal Arthritis in Rabbits. Ibid., 1913, xii, 364.

The joints were swollen, stiff and painful. A hemolytic streptococcus was isolated from material obtained from the tonsillar crypts, and a vaccine prepared and used. In the meantime the tonsils were treated. Following the vaccine, improvement began promptly and resulted in complete relief except for a slight but painless ankylosis in one wrist.

In connection with the use of vaccines I may state that in no instance was there the slightest evidence of any harmful results following their administration. Excessive doses were avoided and the interval was usually from five to seven days.

The more important points that I would like to bring out in this paper may be summarized as follows:

In this group of cases the fact that in the majority the tonsils are found diseased, the fact that an acute tonsillitis often ushers in an attack and the fact that the removal of tonsils in some cases brings on an acute exacerbation, all point to the tonsil as the common atrium of infection. Other atria exist, of course, but are relatively rare.

Extirpation of the diseased tonsil or focus leads commonly to marked improvement or to complete relief. This points to the tonsil as a focus from which infectious material is being constantly disseminated.

In the diseased tonsils a hemolytic streptococcus is found in nearly all cases, often in pure culture.

This streptococcus invariably produces arthritis in animals. The arthritis may become chronic leading to marked deformities, exostoses, atrophies and hyperplasias of joint structures in animals.

After injection of moderate doses the dead autogenous streptococci may cause acute reactions manifested by swelling, redness and tenderness of the involved joints. This fact points to the streptococcus as the cause of the arthritis. The value of autogenous vaccines in the treatment of many of these cases seems unquestionable, which is also an argument in favor of this streptococcus being the causative agent.

The fact that streptococci from other sources, for example, erysipelas, tend to localize in joints and produce similar lesions when injected into animals should not be used as an argument against the streptococci found in diseased tonsils or other foci being the causative agent in these cases. It is rather an argument for it. Susceptibility of the tissues of the host may in these cases be far more important than specificity of the infecting streptococcus.

The streptococci from these arthritic cases have not been clearly differentiated from streptococci from other sources by the various methods we are able to apply. On the whole, they are probably not so virulent as ordinary pyogenic streptococci.

The group of cases discussed in this paper can be fairly definitely separated both clinically and etiologically from the more miscellaneous group of arthritis deformans on the one hand, and acute rheumatic fever on the other. It would seem appropriate to refer to them as chronic streptococcus arthritis.

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Why Register Deaths?—It seems to me that there is almost nothing more important in the entire field of statistics than vital statistics, because of their direct bearing on the health and consequent welfare, of the people.—E. Dana Durand, Director of the Census, Washington, D. C.

A BIOLOGIC CLASSIFICATION OF PNEUMOCOCCI BY MEANS OF IMMUNITY REACTIONS *

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The early work of Koch on etiology led him to formulate certain laws which he demanded should be fulfilled before the relationship of any micro-organism to disease could be regarded as satisfactorily established. Subsequent students have sought to fulfil the requirements of Koch, and the result has been that with the elucidation of each well-recognized infection, a single bacteriologic unit has become accepted as the causative agent. Bacteria, however, are not strictly limited in the pathologic process which they induce, and the lesion caused by a single variety may vary somewhat with its location in the animal body. The pathologic and clinical study of disease is, however, so extensive to-day that the various types of activity of the same bacterial race have been thoroughly described and correlated, so that the nature of the infectious agent can in most instances be assumed from the character of the pathologic process.

From the demonstration by Pasteur of the causal relationship of bacteria to disease, and the evidence of Koch that most infections are caused by bacteriologic units, has come the hope that at some time bacterial diseases may be controlled by specific methods. The increasing study of bacteriology and the practical application of bacteriologic immunity to human disease have made it evident that, in addition to the grosser classification of which bacteria are susceptible, certain finer characteristics exist which serve to differentiate still further members of the same bacterial species. In some instances, certain growth phenomena, such as cultural or fermentative reactions, are sufficient for differentiation; others require the extraordinarily specific methods that have developed from the study of immunity. Although, from the point of view of etiology, the drawing of such fine lines of division may be relatively of minor significance, from that of specific therapy these differences are of primary importance. How numerous and important are the varieties of the main bacterial races is not very well known at present. Most investigators recognize the probability of such a condition, and in the specific bacterial and serum therapy of the day, an attempt is made to cover all possibilities by the use of polyvalent vaccines and immune serums. Such serums and vaccines are, however, prepared without much forethought; heterogeneous collections of organisms are used, and difference in origin is the only standard of differentiation of the various strains employed. In such a method, many individuals may be superfluous, and, on the other hand, some important members of the species may be lacking. In this paper we shall report the results of a biologic classification of the pneumococcus, using in the main certain immune reactions for purposes of differentiation.

For the past three years, we have been engaged in a study of lobar pneumonia at the Hospital of the Rockefeller Institute. The problem in the beginning was approached with a view of obtaining, if possible, a specific therapy. The work of Neufeld[1] and his associates has demonstrated the existence of certain varieties of pneumococcus which, in regard to certain of their immunologic reactions, are fundamentally different. In recognition of the importance of this fact, a study of all pneumococci obtained from human cases has been made. Immune reactions have been chosen for purposes of differentiation because of their peculiar specificity and important practical bearing, and because of the inconstancy of morphologic and cultural differences of strains of pneumococcus. A primary classification has been obtained by means of protection experiments. All the strains of pneumococcus, as soon after isolation as sufficient virulence was attained, have been tested for their susceptibility to the action of serums prepared by immunization of animals to single varieties. White mice were used as experimental animals, and the various mixtures of serum and culture were injected simultaneously into the peritoneal cavity. The results were seldom doubtful. If the organism tested belonged to the same group as that from which the serum had been derived, as great a degree of protection was usually afforded as that manifested against the homologous organism. On the other hand, when a strain belonged to a different group, little or no protection was evident, the tested animals dying for the most part within the same time as the controls. The results obtained from testing different strains in the manner described are shown in Table 1.

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* Read in the Section on Pathology and Physiology of the American Medical Association, at the Sixty-Fourth Annual Session held at Minneapolis, June, 1913.

[1] Neufeld and Haendel: Arb. aus d. Kais. Gesund., 1910, xxxiv, 293.

TABLE 1.—CLASSIFICATION BY PROTECTION

	No.	Per Cent.
Group 1	28	45
Group 2	12	20
Group 3 (mucosus)	9	14
Group 4 (heterogeneous)	13	22
Total typical	49	78
Total heterogeneous	13	22
Total	62	

In this table are enumerated in detail the results obtained from testing the protective power of two different immune serums derived from typical organisms. Preliminary work had previously shown that the two strains of pneumococcus chosen for immunization were probably the ones most frequently associated with lobar pneumonia. In the main the differentiation obtained by protection is sufficiently evident to permit a satisfactory classification. In all, sixty-two different strains have been tested against the two types of immune serums. Of the sixty-two strains, forty, or 64.5 per cent., were susceptible to the action of one or the other type of immune serums. On the other hand, twenty-two strains were either completely unaffected by the immune serum or so little influenced as to render inclusion in either of the typical groups unjustifiable. Of the organisms which could be classified by the protection reaction, twenty-eight, or 45 per cent., of the whole number of strains studied responded to the protection of serum Type 1, and shall be called Group 1. The Type 2 serum exhibited protection against twelve strains, 20 per cent. of the whole number studied. These organisms are classed as Group 2. Of the twenty-two strains not materially influenced by the protective action of the serum, nine were easily differentiated by their distinguishing cultural and pathogenic qualities into a group which we have called Group 3, exhibiting the characters of the so-called *Streptococcus* or *Pneumococcus Mucosus.* These organisms are highly pathogenic for white mice and are completely insusceptible to the action of either of the immune serums in our possession. The remaining thirteen strains must be considered as forming a heterogeneous group, designated as Group 4. These organisms do not possess cultural characters that evidently distinguish them from either of the typical groups, and, although one or another of the serums studied may show slightly increased protection, this is so small when compared with the known protective value of the serum that it does not justify inclusion in the typical groups. These differences are further emphasized later in the discussion of the results of agglutination experiments. The results of the work on protection show the existence of four general groups of organisms as the causative agents of lobar pneumonia. Groups 1 and 2 are made up of organisms that are identical from the point of view of protection with other members of their respective groups. Group 3, *Pneumococcus mucosus,* is formed of organisms having distinctive growth characters. Whether or not further classification of this group is possible by means of immunity reactions has not yet been determined because of the difficulty of obtaining satisfactory immune serums against these organisms. Group 4 has no completely distinctive morphologic or cultural characters, and, as is shown later, consists of a heterogeneous collection of isolated individuals.

AGGLUTINATION

A historical discussion of the studies of agglutination of pneumococcus does not seem necessary in this paper. It is sufficient to state that the pneumococcus is agglutinable in specific immune serums, and that evidence in regard to the demonstration of the existence of different varieties by this reaction is contradictory. Pneumococcus does not always agglutinate readily in high dilutions of immune serums. Fortunately, however, it has the property of remaining suspended or growing diffusely in practically pure normal or heterologous serums, so that serum of considerable strength can be used to bring out specific differences. In the following study, serum and twenty-four-hour broth-cultures of the organism were mixed together in equal quantities. The reactions were read by the macroscopic method after one or two hours at 37 C. (98.6 F.), and again after twenty-four hours at either 37 C. or room temperature. Agglutination usually begins to be visible in from fifteen minutes to half an hour, and appears first as a fine granulation of the suspension; the clumps finally sink to the bottom of the tube and in the end usually form a firm, scale-like mass in the bottom of the tube which cannot be broken up, even by vigorous shaking. If the mixtures are allowed to stand for twenty-four hours at 37 C., a precipitation of serum and organisms sometimes occurs in the control tubes which, however, after a little experience is easily distinguishable from a true agglutination. In control tubes, even when such a precipitation occurs, the majority of the cocci remain freely suspended, whereas when specific agglutination develops, the supernatant fluid always becomes perfectly clear. The organisms studied were tested against the same two types of serums used for the protection experiments, and the results obtained are shown in the Table 2.

Study of the agglutination reactions of these strains of pneumococci shows that specific differences can be brought out by this method between individual members of a collection of organisms. The strains again fall into definite related groups, and the percentage of distribution is about the same as that obtained in protection experiments. In every instance in which an organism could be definitely placed by protection in one of the groups described, the agglutination reaction has corre sponded with this classification. Two strains, 56 and 86, showed doubtful protection with both types of serums, but on agglutination reacted specifically with serum Type 1.

TABLE 2.—CLASSIFICATION BY AGGLUTINATION

	No.	Per Cent.
Group 1	22	41
Group 2	11	20
Group 3 (mucosus)	9	17
Group 4 (heterogeneous)	12	22
Total typical	42	77
Total heterogeneous	12	23
Total	54	

By the methods of protection and agglutination, it has been possible to classify the pneumococci associated with lobar pneumonia in man into four groups. Groups 1 and 2 consist of members closely related immunologically to other members of their respective groups. Group 3 is formed of *Pneumococcus* or *Streptococcus mucosus*. Of nine members of this group studied, eight possessed the common characters of pneumococcus in addition to the quality of forming mucus, and one those of streptococcus. The latter organism was insoluble in bile, failed to ferment inulin, hemolyzed blood mediums, and exhibited other characteristics of *Streptococcus longus*. It formed, however, abundant mucous exudate in animals, grew in large mucoid colonies and showed well-developed capsules. A study is now in progress to determine whether or not immunologic differences exist between individual members of the mucous group. The fourth group consists of heterogeneous members, and a further study of this group appears later. All the strains of pneumococcus examined were studied by the usual cultural methods. Although average cultural and morphologic differences exist between the different groups, these are variable and are not reliable for purposes of identification, except those of *Pneumococcus mucosus*. All the strains studied, except the *Streptococcus mucosus* mentioned before, were either bile-soluble on isolation or have become so on animal passage. Fermentation of inulin is not more characteristic of one group than another. Capsules are somewhat easier to demonstrate among members of Group 1 and *mucosus* than in Group 2 and the heterogeneous group. The average morphology of the various groups shows some differences. In Group 1, individual cocci are medium-sized, slender and show a slight tendency to rounded ends. Individuals of Group 2 are larger, fairly broad and almost invariably show perfect lancet-shaped forms. The morphology of *Pneumococcus mucosus* is quite characteristic, showing voluminous capsules containing medium-sized, closely approximated cocci with definitely rounded ends. In general, members of the heterogeneous group tend to exhibit pairs of rounded individuals, but may resemble completely either Group 1 or Group 2. The virulence for mice of strains of the typical Groups 1 to 3 is usually higher and more constant than that of the heterogeneous Group 4. A continuous study of a number of members of the different groups may thus bring out certain more or less characteristic differences. These, however, are not constant, and cannot be depended on for purposes of classification.

The frequency with which the different types of pneumococcus appear as the cause of lobar pneumonia is of considerable interest. Altogether it has been possible to obtain a biologic classification of the pneumococci from seventy-four cases of typical lobar pneumonia. In thirty-five instances, 47 per cent., the organisms belonged to Group 1; in thirteen instances, 18 per cent., to Group 2; in ten instances, 13 per cent., to Group 3 (*mucosus*) and in sixteen instances, 22 per cent., to Group 4 (heterogeneous). Almost one-half the cases of pneumonia which we have seen are due to pneumococci belonging to Group 1. Members of the other groups occur less frequently. In 78 per cent. of the cases examined, the organisms obtained have possessed distinguishing characteristics which permit a definite biologic grouping. The remainder do not have distinctive common immunologic or growth characters and must be classed as heterogeneous. Immune serums have been prepared with organisms from Groups 1 and 2, and apparently all members of these two groups are susceptible to the protective and agglutinative action of these serums. The immunity reactions of Group 3 (*mucosus*) have not as yet been completed.

Group 4 has been called heterogeneous. The reason for this classification is shown in the following study: Animals were immunized to various members of this group and the immune reactions which had been found to be common to members of Groups 1 and 2 were studied. So far, it has not been possible to protect animals against any of the heterogeneous strains, when serum derived from another strain has been used. The immune serums obtained protected against only the homologous organism. An example of the method employed is shown in Table 3. The immune serum was obtained by immunization of an animal to Pneumococcus 71. The cultures used for infection were twenty-four-hour broth-cultures, freshly obtained from passage through animals. Culture and serum were injected simultaneously into the peritoneal cavity of white mice.

Certain other strains belonging to the heterogeneous group have been tested in the same manner, and in no instance has any cross-protection been observed. From Table 3 it is seen that not only does Serum 71 fail to afford any protection against heterologous strains, but in some instances even increases the fatality of the smaller doses of culture. The serum, however, possessed a high protective power against the homologous organism. The condition of affairs is, therefore, quite different in this group from that observed in Groups 1 and 2. In the latter a serum derived from one member of the group seems to protect animals against infection with all other members of the group, whereas in the former, no instance of cross-protection has been observed.

In addition to the protection reactions, cross-agglutination among members of this group has been carefully studied. The technic employed was the same as that previously described. The results are shown in Table 4.

In this table the results obtained from testing fourteen different strains against serums derived from eleven of the strains are presented. The agglutination reaction has again confirmed the results of protection experiments. In only one instance was cross-agglutination observed, Pneumococcus 55 by the polyvalent serum obtained from Pneumococci 34, 38 and 71. In two other instances, Pneumococci 37 and 52, agglutination occurred in heterologous serum, but the reaction took place much more slowly than that of the homologous organisms. The study of cross-protection and agglutination among members of the heterogeneous Group 4 indicates that this group comprises a number of distinct varieties of pneumococcus which cannot be related to one another by immunologic reactions. Culturally they are true pneumococci and manifest all the common characters of pneumococcus.

The study of certain biologic reactions of a large number of strains of pneumococci isolated from cases of pneumonia in man has developed some interesting facts. The organisms studied fall into two general groups. One of these, containing a large majority of all strains investigated, consists of three apparently fixed races, and the other of a smaller number of strains, each of which seems to form a distinct variety. The individual members of two of the fixed races (Groups 1 and 2) can be distinguished certainly from one another only by means of highly specific immune reactions. Single strains, however, belonging to either of these two groups have immune reactions in common with all other members of the particular group to which they belong. The other apparently fixed race consists of the organisms designated as *Pneumococcus mucosus*. Although the latter classification has been based on cultural reactions and does not exclude the existence of different varieties, from the point of view of immunity, incomplete immunologic studies indicate that most of these organisms can also be further related by means of immunity reactions. In striking contrast to these three groups is the fourth or heterogeneous group, which seems to consist entirely of isolated individuals. The significance of such a situation is difficult to interpret. Whether this mixture is being progressively differentiated into groups with common characters, or whether each member is a descendant of one of the fixed groups that has undergone a fundamental change by being forced to adapt itself to some special environment, cannot be determined from the evidence at hand. It is not impossible that the fixed races are more highly parasitic and are never very far removed from a condition of pure parasitism, whereas the heterogeneous strains may be representatives of the type of pneumococcus found in the normal mouth and consequently more likely to have undergone environmental changes.

The specificity of the immunity reactions has been very striking and, from the practical point of view of specific therapy, is of great importance. A large amount of work has been devoted to study of the agglutination reactions of pneumococcus. Kindborg[2] has found that satisfactory agglutination occurs practically only when homologous serums are used. On the other hand, Hiss[3] has obtained a wide degree of cross-agglutination. Such contradictory results may largely depend on the investigator's luck in securing suitable organisms. If the collection should consist of a majority of members of one of the fixed groups, cross-agglutination would be the rule, whereas if the heterogeneous strains should predominate, a high degree of individual specificity would be observed. The fact that cross-protection does not occur except among members of individual groups of the fixed races has an important practical bearing. If polyvalent serums are to be used in the therapy of lobar pneumonia, such serums must be derived from representative members of the typical groups, if the therapeutic application is to be successful. On the other hand, if one uses univalent serums, representing each of the fixed races, a diagnosis of the type of organism concerned in individual instances of the disease must be made. The latter method is quite practicable and has been successfully employed at the Hospital of the Rockefeller Institute during the past year. Whether or not the results obtained from this study of pneumococci can be profitably applied to other pathogenic bacteria cannot be definitely asserted. It is not, however, illogical to assume that such a classification of other infectious organisms could be made. If this is true, in order that specific bacterial and serum therapy may be intelligently applied, such a study becomes imperative.

TABLE 3.—CROSS-PROTECTION WITH STRAINS OF HETEROGENEOUS GROUP

Amount of Culture, c.c.	Amount of Serum, c.c.	Different Strains and Results								
		Homologous Pn 71	Type Gr. 1 Pn 1	Type Gr. 2 Pn 6	Pn 36	Pn 37	Pn 52	Pn 55	Pn 60	Pn 76
0.01	0.2	*	D 20†	D 18†	D 18†	D 18†	D 18†	D 18†	D 18†	D 18†
0.001	0.2	*	D 36†	D 18†	D 18†	D 18†	D 18†	D 18†	D 18†	D 18†
0.0001	0.2	*	D 36†	D 36†	D 18†	D 18†	D 36†	D 20†	D 18†	D 18†
0.00001	0.2	*	D 36†	D 24†	D 18†	D 18†	D 36†	D 24†	D 18†	D 20†
0.001	—	D 18†	—	—	D 18†	D 18†	D 20†	D 18†	D 20†	D 24†
0.0001	—	D 18†	D 36†	D 24†	*	D 20†	*	D 20†	D 18†	*
0.00001	—	D 3.5‡	D 36†	D 36†	D 5‡	D 36†	D 3‡	D 36†	D 36†	D 3‡

*Survived. †Hours. ‡Days.

TABLE 4.—STRAINS TESTED AND RESULTS OF AGGLUTINATION

Sera	Pn 1	Pn 2	Pn 34	Pn 36	Pn 37	Pn 38	Pn 52	Pn 55	Pn 60	Pn 62	Pn 71	Pn 76	Pn 82	102
Pn 1	+	0	0	0	±	0	0	0	0	0	0	0	0	0
Pn 2	0	+	0	0	0	0	0	0	0	0	0	0	0	0
Pn 36	0	0	0	+	0	0	0	0	0	0	0	0	—	0
Pn 37	0	0	0	0	+	0	0	0	0	0	0	0	0	0
Pn 55	0	0	0	0	0	0	0	0	+	0	0	0	—	0
Pn 71	0	0	0	0	0	0	0	0	0	0	+	0	—	0
Pn 76	0	0	0	0	0	0	0	0	0	0	0	+	0	0
Pn 87	0	0	0	0	0	0	±	0	0	0	0	0	+	0
Polyvalent Pn 37, 38, 57	0	0	0	0	0	+	0	+	0	+	0	0	—	0

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. CAPPS, DAVIS, DOCHEZ AND GILLESPIE

Dr. Frank Billings, Chicago: In chronic joint infection one must remember the blood-supply of the joints. It is distinct for the periarticular structures, for the synovial membrane

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2. Kindborg: Diss. (Halle), Leipsic, 1905. Ref. Centralbl. f. Bakt., 1906, Part 1, xxxviii, 172.
3. Hiss: Jour. Exper. Med., 1905, vii, 547.

and for the medulla of the bones which enter into the joint. Blood infection may take place only through these three channels. That explains why infection may at one time be periarticular or synovial, and at another osteoarthritic, or why all three types of infection may be present in a joint at the same time. I believe that many of the chronic joint diseases are infectious: even in some of the senile joint troubles infection may be a coincidence. The word senile must include the atrophic degenerations of the joints which at times occur in relatively young individuals. The morbid anatomy of chronic joint infections may be so nearly alike for various bacteria that the pathologist cannot differentiate them. The clinician may, however, group these different forms of infectious joint trouble because of rather characteristic clinical phenomena. For instance, a streptococcus infection may not only produce a periarthritis or synovitis or osteo-arthritis or changes in all three structures of a joint, but may also produce a chronic myositis. In probably every chronic streptococcus joint infection there is a myositis present in some part of the patient's body. Usually this is selective and involves the biceps humeri, the masseter, the erector spinae, the hamstring, the quadriceps femoris and the anterior tibial group of muscles. I do not mean that all of these different groups of muscles are involved in any one patient, but some of them may be. In addition, the patient who has been ill for a considerable period will show alteration in the general nutrition and metabolism, as evinced by an overgrowth of hair on the extremities, a change in the nutrition of the nails and often an evidence of atrophy of the skin itself. In all probability these malnutritional metabolic changes are the result of the long illness, but may be secondarily due to the infective agent. The streptococcus group can therefore be set aside clinically because of the attendant chronic myositis. The gonococcus chronic joint infections may have a morbid anatomy so like that of the streptococcus that one cannot differentiate, but clinically I have never seen a myositis in gonorrheal arthritis; there is frequently present, however, a tenosynovitis, and tenosynovitis I have never seen in streptococcus chronic arthritis. In the treatment one must first locate and remove the chronic focus of infection. This must be done thoroughly. Following this the patient must have a long period of rest, and this time of rest must, of course, be individual. The patient must have good, wholesome food to improve the general nutrition. To improve the immunity of the patient, in addition to the measures already described, one may use autogenous vaccination, which is of secondary importance as compared with the rest treatment and attention to the general nutrition of the patient. If autogenous vaccination is used it is possible that some benefit may result, if a bacteriologic diagnosis has been made in advance, from the use of commercial stock vaccines chosen on the basis of the bacterial diagnosis. Stock vaccine chosen on any other basis is a haphazard method of treatment.

On these principles I have managed patients with chronic arthritis with unusually good results, amounting to recovery in cases in which the joint changes have not gone on to a destructive stage and in severe types to improvement of the patient by bringing to a stop the progress of the disease.

Dr. G. L. Richards, Fall River, Mass.: In the last few years many patients have been referred to us on account of rheumatism. I should like to know whether Dr. Davis advises the removal of the tonsil whenever the diagnosis of rheumatism is made, or would he depend on the determination of streptococci in the tonsil? I refer especially to the small tonsil in which, if you draw the anterior pillar back, you may find a little tonsillar secretion or partially coagulated secretion or pus. Should we have a culture made from the surface of that tonsil before we take up the question of operation?

Dr. Davis spoke of cases in which the tonsillotome was not used because of the blood-pressure. What is the limit of blood-pressure which would contra-indicate operation?

After the operation of tonsillectomy there is a certain refilling of the spaces between the anterior and posterior pillars, and the laryngeal follicles at the base of the tongue may enlarge a little. Is there not some tendency of the infection to occur again, or is the danger from rheumatism over after the removal of the tonsil?

Although tonsil operating is being done rather indiscriminately throughout the United States at present, operations on the tonsil require just as much care as any other type of operation and should be attempted only by those who possess the proper qualifications.

Dr. Henry Albert, Iowa City, Iowa: I should like to ask Dr. Capps in what proportion of the cases of epidemic sore throat of milk origin there was tonsillitis and in what proportion pharyngitis. I presume it is almost always a follicular tonsillitis. During the past year I performed some experiments which, I believe, might be applicable in the treatment of the cases of tonsillitis accompanied by rheumatism. With the idea of treating diphtheria carriers I aimed not only at disinfecting the crypts of the tonsils, but also at producing a reaction. This was done by the use of silver nitrate. I used solutions of different strength (from 5 to 40 per cent.) applied to the tonsillar crypts, five minutes, fifteen minutes, one day, two days and seven days before the removal of the tonsils. I found that, if a solution stronger than 10 per cent. was well applied to the crypts, the entire epithelial layer would be destroyed. In almost any strength there was considerable inflammatory reaction. The experiments were not continued long enough in any case to show whether or not there was any occlusion of the crypts. The immediate effect of the silver nitrate is a destruction of the epithelial lining of the crypts. I hoped that, before the cells could regenerate, there would be sufficient proliferation of the fibroblasts to lead to occlusion of the crypts of the tonsils. At any rate, so far as the diphtheria-carrier condition was concerned, this treatment had good effect, and I do not see any reason why that would not be a good procedure when the removal of the tonsil is objected to, especially in view of the fact that the removal of those tissues sometimes causes an exacerbation of the joint lesions.

Dr. Norman Bridge, Los Angeles: I should like to say a word from the point of view of the practicing physician. These investigations are among the most valuable that have been made. They are interesting because physicians cannot entirely agree on some of the questions, for instance, the character of the micro-organism. That makes for progress and is unavoidable in the development of the science of bacteriology. The lesson to the practicing physician, however, is one of the most momentous of all. It seems to me that we are coming to the point of believing that a large percentage of the cases of acute rheumatism originate in the tonsil, whatever the character of the microorganism may be. There is a considerable proportion of young persons, more young than old, who acquire acute rheumatism and endocarditis with leaky valves, and live on through life more or less crippled as a consequence. It seems to have been proved that removing the tonsils does no harm. Removing them, moreover, completely abolishes one source of infection. It seems as though we were coming to the point of finding it a duty to advise the removal of the tonsils as a regular and standard measure for the protection of the young. I do not know that I would advise that to-day, but this will be the practice in the future, judging by the proofs that are being accumulated through the labors of students of biology. I am positive that the tonsils should not be removed by the man who is simply capable of using a tonsillotome, and they should never be removed by the old-fashioned tonsillotome; they should be enucleated completely by the most modern method by those familiar with this operation. I am anxious to hear whether or not there is any definite scientific objection to advising parents that it would protect the lives of their children, at least protect against possible rheumatism and chronic arthritis, if the tonsils were removed.

Dr. Louis F. Jermain, Milwaukee, Wis.: Considerable stress has been laid on the importance of the tonsil as a portal of entry for invading micro-organisms to joint structures. Attention has also been directed to sinus disease and other possible foci. In this connection, we must not forget suppurative processes in the mouth and especially of the teeth and gums. I believe that the primary focus is often in the teeth and gums, and the infection spreads from there to the tonsils or may invade the body directly. In my own case I am certain that a bacterial invasion occurred in this manner, namely, primarily in the gums, thence to the tonsils and subsequently to joints. What I wish to emphasize is, that we should not be content with a removal of the tonsils, but should endeavor to eliminate all possible foci of invasion.

Dr. J. A. Capps, Chicago: In reply to Dr. Albert's question I would say that in most of the cases in all these epidemics a redness of the throat is described which is diffuse, spreading over both the pharynx and the tonsils, so that one can say there is both pharyngitis and tonsillitis. In some cases there is an exudate thick enough and extensive enough to resemble a diphtheritic membrane.

Dr. D. J. Davis, Chicago: In answer to the question of Dr. Richards concerning the extirpation of the tonsils, I would say that this is not always an easy matter to decide. In chronic arthritis the tonsils are at fault in most cases. Our attention is therefore directed first to a careful examination of these organs. Other foci may also be present. For example, alveolar abscesses are not infrequent. They frequently occur with infected tonsils. Either one or possibly both may be at fault; or one may depend on the other. There may be still other foci. This all means that we must subject the entire body to a most careful physical examination. If the tonsils are diseased they should be treated. If the teeth are diseased they should be treated. I think that one can often, but not always, detect these tonsillar infections from the appearance of the tonsils. But sometimes the tonsils are smaller than normal. At times also by a careful examination one can find little pockets of pus in tonsils that look quite normal on the surface.

There will perhaps be cases now and then in which no focus can be found. Under these conditions I think one is justified in enucleating the tonsils with the hope that this operation may do good. The bacteriologic examination should be correlated with the other findings. It ought to be quite unnecessary to say that in every instance complete enucleation should be carried out. In four of the cases referred to the tonsils had been removed previously; that is, the top of the tonsil had been sliced off. This operation did absolutely no good. There were recurrences and I am inclined to believe that this operation is actually dangerous, because it causes the fibrous tissue to form about the openings of the crypts preventing proper drainage.

The case of high blood-pressure that I mentioned occurred in a man, about 60 years old, suffering with chronic arthritis. The blood-pressure ranged from 190 to 210 and as he had had some experience with hemorrhage, it was thought unwise to operate on the tonsil. The crypts were opened and pus was obtained. It was clear that they were infected and vaccination and treatment of the tonsil resulted in a striking recovery. I have not made any bacteriologic examination of the lymphoid tissue of the pharynx.

THE TEACHING OF LABORATORY PHYSIOLOGY

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At a time when there is growing complaint about the overcrowding of the medical curriculum, resentment among undergraduates at the waste of time in conducting apparently fruitless experiments, and caustic criticism among graduates aimed at the teaching of isolated facts of undemonstrable utility, it may not be amiss to examine some of the conditions toward which adverse comment is directed. Possibly the irritation felt has a justification; possibly the curriculum might be lightened and improved by clearing away the relatively unessential and placing more emphasis on data of unquestioned adaptability. That such a clarifying investigation might be profitably conducted in nearly every branch of medical teaching seems to be generally believed by the practicing profession. The present discussion, however, must be limited in subject-matter principally to laboratory physiology.

As a brief preliminary, it should be accepted as axiomatic that the matriculant in medicine is thereby a self-limited specialist. He has chosen to concentrate his energies in acquiring the difficult art of preventing as well as curing the varied ills to which human flesh seems heir. He seeks specific knowledge, not desultory information; purposive data, not cursory generalities. To assist him in realizing his laudable ambition, great stress should be laid on such facts as have well-defined utilizable value in the practice of medicine and surgery. Such facts as have but a remote relationship to the practice of medicine may well have their consideration deferred until the more important subjects have been disposed of. So it is, when the medical student enters the laboratory of physiology, he comes seeking experimental demonstrations concerning the functioning of all the structures of the human body, the architecture of which he has been studying in the laboratory of anatomy. He does not seek, as he does not need at this time, information concerning the reactions of *Rotifera, Coelenterata* or *Batrachia*. General biology and zoology belong to the academic side of the university and should there be considered, if at all, in a course preliminary to the medical. Likewise, comparative physiology—an intensely interesting subject—should not be allowed to usurp time vitally needed for consideration of the far more important subject of human physiology. That time spent on experiments in general biology constitutes a usurpation is shown by the fact that no medical school, so far as can be learned, has sufficient time in its course in laboratory physiology to do even scant justice to some divisions of the subject; notably, physiology of the brain. Yet, I submit, it is infinitely more important that a student learn those fundamental tests of normality whereby he may be enabled to save a handicapped child from condemnation to relative idiocy than it is that he should be conversant with the graphic record of heart-block in *Rana esculenta*.

A depressing amount of time is spent in worrying about the elasticity, contractility and spasticity of the frog's gastrocnemius, in entire forgetfulness of the fact that many of the so-called classic experiments are now of historical interest only. It is not to be denied that many of the routine experiments were of much value as original investigations; but such value fails to reappear when the experiment is repeated in the laboratory of human physiology, inasmuch as its original purpose is neglected, and, moreover, it is not demanded by present circumstances. The function of the department of physiology in a medical school is to give students a vivid acquaintance with the varied activities of the normal human body; it is not its function to fritter away the time of embryonic expert clinicians by making haphazard, elementary drives at abstruse research. If there be discovered, occasionally, a student possessing the qualifications peculiar for research, he may easily be singled out and given such problems as his time and ability permit. To the average student, however, it is an injustice to require him to use his time performing experiments of inconsiderable value. Moreover, to quote Thorndike.[1]

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[1] Thorndike: Education, p. 178

experiments conducted on animals. For all the frog muscle-nerve experiments having any possible medical significance, it is perfectly feasible to substitute related experiments on living human subjects. Who will deny that, for medical students, such substitution would greatly augment the value of the experiments? The data obtainable by animal experimentation in the research laboratory can be far more scientifically imparted by a few moments' intelligent discussion, or demonstration, than by several hours of crude attempts by amateurs at the same experiment. It is, moreover, as uneconomical as it is unscientific to spend two hours in learning by instrumental manipulation what could be more thoroughly comprehended by five minutes of concentrated thinking. Circulation experiments by vivisection provoke some curiosity and wonder, when similar demonstrations with mechanical models stimulate imagination, reason and judgment. There seems no limit to the illustrative devices possible to scientific ingenuity, automatons imitative of practically every bodily movement and function being readily contrivable; and such models, because of their simplicity and definiteness, are much more richly illustrative than anything a student can ordinarily obtain from the anesthetized cat, dog or guinea-pig.

A few searching questions asked of the average practitioner quickly show that there is considerable need for experimental work so arranged as to illuminate the actions of muscle-groups as well as of individual muscles; and this work might well be preceded by a carefully selected series of experiments dealing with the physiology and mechanics of bones and joints. For experiments in circulation and respiration no animal experiments (capillary circulation excepted) can compare in value with the data obtainable from examinations of fellow-students, and from manipulating mechanical models. Experiments in digestion and absorption have been largely transferred to a separate department of chemistry. The special senses could well receive much more attention than the customary allotment, while the brain, with its activities as manifested in emotional and intellectual states, should be given extensive attention in laboratory investigation. No division in physiology is more important; no section is more neglected. Even "standard" text-books on physiology devote their consideration of the central nervous system to a discussion of anatomy and somatic reflexes. And, as Loeb well says:[7]

> We can no more expect to unravel the mechanism of associative memory by . . . morphologic methods than we can expect to unravel the dynamics of electrical phenomena by . . . counting and locating the telephone connections in a big city.

Very little brain physiology as expressed in mental states is discoverable in any text-book. Yet such states exert a tremendous influence on all with which the physician has to deal. Therefore both their conditions and revelations need and deserve careful, serious consideration. True, such a course constitutes physiologic psychology; but who needs such a course more than the physician? Certainly society needs to have every physician trained in such a course.

Let us clear away our pedagogic cobwebs. Let us throw out from our medical curriculum everything not demonstrably applicable and, in its place, let us give a course of applied science throughout. So may our burdened curriculum be lightened, our students held with intense interest, our graduates strengthened to grapple more adequately with their problems, and society cheered and comforted.

SUMMARY

I can do no better, in closing, than to quote the following pregnant words from O'Shea:

> "In every machine there are economical as well as wasteful methods of operation, and the same must be true in principle of the brain. A given amount of force can accomplish more in promoting activities in well-organized than in poorly-organized areas."[8] Hence "an individual should be required to perform during his learning-period those activities which he will be called on to perform most often in maturity. He must be practiced in doing as an apprentice what he will have to do as an artisan."[9]

433 Main Street.

A STUDY OF THE SPINAL FLUID IN ONE HUNDRED CASES OF SYPHILIS

INCLUDING INVESTIGATIONS FOR ARSENIC AFTER INTRAVENOUS ADMINISTRATION OF NEOSALVARSAN [*]

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Examination of the spinal fluid has in recent years become of great value in the study of syphilis of the nervous system, particularly in the so-called parasyphilitic conditions, tabes and paresis, which we now know, through the investigations of Noguchi and others, to be not parasyphilitic but due to the invasion of the cerebrospinal system by the *Spirochaeta pallida* itself.

We undertook the investigation of the cerebrospinal fluid on account of the definite findings that can be demonstrated in it to indicate an invasion of the cerebrospinal system by the *Spirochaeta pallida*, the purpose being to determine what percentage of patients with syphilis applying for treatment at a general dermatologic clinic would show evidence of spinal invasion.

The large percentage of early syphilis reported in literature as giving evidence of meningeal disturbance encouraged us. All of the cases of syphilis, therefore, in the outpatient department of the Washington University Hospital and the Barnard Free Skin and Cancer Hospital, if the patient would submit to spinal puncture, were studied.

All of the cases in the investigation were examined in the following manner: Blood and spinal fluid were obtained simultaneously and a Wassermann reaction made on the two fluids, two separate antigens being used with increasing amounts of spinal fluid, beginning with 0.2 c.c. and increasing to 0.5 c.c. The cells in the spinal fluid were counted from undiluted fluid in the ordinary blood-counting chamber. The globulin reaction was determined by the Noguchi method. Fehling's reduction test was also performed on each fluid, as normal spinal fluid reduces Fehling's solution, owing supposedly to the presence of pyroincrease in the size of the heart. A study of the heart-weights in the group showed in the 20 cases without endocarditis only 10 with a weight exceeding 300 gm. Of these 10 the heart-weight of five exceeded 350 gm.

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[7] Loeb: Physiology of the Brain, 1902, p. 289.

[8] O'Shea: Education as Adjustment, p. 264.

[9] O'Shea: Education as Adjustment, p. 265.

[*] From the Medical Department of Washington University and the Barnard Skin and Cancer Hospital.

[*] Read in the Section on Dermatology of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

[*] Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the authors' reprints.

In these 5 cases with this degree of cardiac enlargement there were 3 cases with arteriosclerosis, 1 case of exophthalmic goiter, and 1 case of subacute glomerulonephritis. Cardiac enlargement is present frequently in each of the foregoing conditions, so that the heart hypertrophy may have been caused in part in these 5 cases by the associated disease as well as by the adhesions.

Of the 6 cases in Group 1 with endocarditis, 5 had a degree of heart enlargement exceeding 350 gm.; 1, 732; 2, 528; 3, 510; 4, 403; 5, 370. The average weight of the hearts in this group was 352 gm. Cardiac enlargement was not marked in those cases in which tuberculosis may have been a factor in the production of the adherent pericarditis in the absence of endocarditis or nephritis. The average weight of the heart was but 340 gm.

From the study of the effects of adhesions it would seem from these cases in Group 1 that no marked increase in the size of the heart need follow slight adhesions, bands or even pericardial obliteration, in the absence of some other well-recognized cause for heart enlargement, as endocarditis, nephritis or arteriosclerosis.

In one case, in a woman aged 28, in which both pleural cavities were obliterated as well as the pericardial cavity, with binding down of the sternum, the heart-weight was but 377 gm.

A study of the clinical records failed to show any heart murmurs in these cases in Group 1 which were not to be explained by the associated endocarditis, arteriosclerosis and relative mitral regurgitation present.

The unimportant Group 1 may be dismissed from further study.

Two striking things in Group 2 are noted: (1) the presence of one or more rheumatic attacks in the history in 22 of the 36 cases; (2) the presence of endocarditis in 27 of the 36 cases.

The diagnosis of rheumatism is so ill-defined that great care in attributing rheumatism as a factor in the production of adherent pericarditis was taken. Careful examination of the previous record showed that in 13 of the 22 cases there was no doubt of the previous rheumatic infection; in 5, the diagnosis of a previous rheumatic attack was probable; in 4 it was possible.

In the etiology of these cases of adherent pericarditis in Group 2 there was no other infective disease so prominent in the previous history as rheumatism. In 8 cases tuberculosis of a bronchial or mesenteric lymph-node was found post mortem.

The 27 cases of endocarditis in Group 2 were as follows:

Acute endocarditis alone, 6:	
Aortic and mitral	4
Aortic alone	1
Mitral alone	1
	6
Chronic endocarditis alone, 12:	
Aortic and mitral	5
Aortic alone	1
Mitral alone	3
Aortic, mitral and tricuspid	2
Aortic, mitral, tricuspid and pulmonary	1
	12
Acute and chronic, 9	
Aortic and mitral	6
Mitral alone	1
Aortic, mitral and tricuspid	2
	9

The influence of the adherent pericardium is difficult to determine in the presence of endocarditis of such extent as in Group 2. The mitral and aortic valves showed endocarditis 15 times, mitral alone 5, aortic alone 2, aortic, mitral and tricuspid 4, and aortic, mitral, tricuspid and pulmonary 1. In the endocardial damage itself, sufficient cause for death existed if we judge from similar cases of endocarditis without adherent pericarditis.

It is of interest that of these patients with positive, probable, or possible rheumatic infection, endocarditis was present in every case except one.

In group 2 the heart-weights are available in 31 of the 36 cases. The weight of the heart was over 300 gm. in 29 of the 31 cases:

Gm.	Cases.	Gm.	Cases.
300-400	6	820	1
400-500	7	1,150	1
500-600	8	1,273	1
600-700	3	1,328	1
700-800	1		

In 7 of the cases the pathologic condition made it necessary to include the pericardium in the heart-weight.

The average weight of the heart in this group was 592 gm.

It is impossible from a study of these cases to state what part the pericardial adhesions may have had in the production of the cardiac hypertrophy. The fact that cardiac hypertrophy was not marked in the cases in Group 1, in some of which the adhesions were equally extensive, would point toward the belief that the cause of the heart hypertrophy is more apt to be associated with the primary rheumatic condition or the associated endocardial lesion.

Attention has been called to the effect of the toxin on the myocardium in cases of acute rheumatic infection, notably by Fisher.[1] He says:

> The view that rheumatism can produce toxic enlargement of the heart is also supported by the fact that in rare instances cardiac hypertrophy and dilatation may be seen in the postmortem room following rheumatism when neither pericardial adhesions nor lesions sufficient to interfere with the function of the heart valves prove to be present. Isolated cases have been reported in which, post mortem, marked changes in the myocardium follow rheumatic infection.

Weil and Gallavardin[2] have recently reported such a case.

Fenton lays more importance on the effect of the rheumatic poison on the heart muscle than on the endocardial or pericardial changes. He says:[3]

> The train of events, which leads up to the clinical picture noted in connection with chronic adherent pericarditis, appears to be that the main pathologic condition associated with this lesion is one of dilatation, the result of the action of the rheumatic poison on the heart muscle and subsequent hypertrophy. Dilatation takes place during the acute or subacute periods of the phase which precedes the chronic adhesion. In a few mild cases it may pass off, but in the great majority it does not, and hypertrophy and external adhesions follow, resulting in a condition of unstable equilibrium in which the constant tendency is to increase dilatation and failure, owing partly to a certain amount of embarrassment to systole, caused by external adhesions, but mainly to a permanent damage to the heart muscle, in a measure resembling those cases of chronic cardiac failure in more advanced life in which there is nothing to account for the symptoms but functional change in the properties of the heart muscle, and which is generally accompanied by progressive decline in its powers.

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[1] Fisher, T.: Brit. Med. Jour., 1907, i, 840; Clin. Jour., 1907, xxx, 308.

[2] Weil and Gallavardin: Arch. de méd. des enf., 1900, ii, 193.

[3] Fenton: Adherent Pericardium, Practitioner, lxxxi, 637.

The presence of nephritis in 11 of these cases in Group 2, in 6 of the glomerular type, makes it even more difficult to attempt an interpretation of the part the pericardial adhesions may have played in the heart enlargement.

The effect of adherent pericarditis in the absence of a rheumatic infection in the history, and in the absence of endocarditis may be studied in the 8 remaining cases in this group. The heart-weights are available in 7 of the 8 cases. In 6 of the 7 cases the weights were over 400 gm.; in one, a boy of 10, with adherent pericarditis, following osteomyelitis, the heart-weight was 135 gm. A glance at the chief cause of death in these cases with enlarged heart shows that the adherent pericarditis apparently was of no great importance in the production of the heart enlargement, or in the cause of death.

1. Arteriosclerotic nephritis, cardiac thrombosis.
2. Chronic interstitial nephritis, coronary arteriosclerosis, chronic lead-poisoning.
3. Amyloid nephritis, syphilis, hypertrophy, dilatation of heart.
4. Aneurysm of aorta.
5. Dissection aneurysm with rupture.
6. Arteriosclerosis, cardiac thrombosis.
7. Osteomyelitis, empyema.
8. Chronic interstitial myocarditis with cardiac aneurysm, chronic pleuritis, perihepatitis and perisplenitis.

In Case 8, with pleuritis, perisplenitis and perihepatitis, the condition of the pericardium is stated to be as follows: In the region of the apex over the wall of the left ventricle, near the interventricular septum, there is a broad band of dense, fibrous tissue binding the parietal and visceral pericardium together. The incidence of lead in one, and syphilis probably in three, is of interest in these cases.

Careful analysis of the murmurs recorded in the records in these cases of Group 2 failed to show any murmurs which could not be explained by the associated endocarditis, or by the heart condition, independent of the adherent pericarditis.

The reason why adherent pericarditis is overlooked is apparent from a study of these two groups of cases. In the first place, the direct signs or symptoms suggesting the cardiac condition are so slight that attention is not attracted to adherent pericarditis as a possibility, in the presence of some other prominent, well-defined condition from which the patient is suffering. On the other hand, judged by this group of cases, in which cardiac symptoms were present, and adherent pericarditis might have been considered, in only one case of the 37 was there no other cardiac or renal manifestation which might not explain the cardiac symptoms. With endocarditis present in 27 of the 36 cases in the group in which cardiac symptoms were prominent, and well-defined pathologic changes present to account for the cardiac symptoms in 8 of the 9 remaining cases without endocarditis, there is left but a single case of cardiac death in which, post mortem, no endocarditis and no glomerulonephritis were present.

In this one case, in a girl of 11, with a previous rheumatic history who died from cardiac decompensation, the anatomic diagnosis was chronic adhesive pericarditis, hypertrophy and dilatation of the heart; chronic passive congestion of lung, liver, spleen and kidneys; ascites; hydrothorax; slight edema of lower extremities, and hypoplasia of uterus. The pericardial sac was everywhere adherent to the surface of the heart by firm connective tissues.

A study of the clinical record of this case shows that the heart impulse was palpable with corresponding dulness just beneath the sixth rib, 10 cm. from midsternum, from 3 to 5 cm. outside the nipple line; to right 2 cm. outside the third space. Action regular, rapid; loud, blowing systolic murmur at apex, replacing first sound, transmitted to axilla. Pulmonic second accentuated. Same murmur heard over precordia and back. Pulses equal and synchronous, of small volume and low tension. Liver from the sixth rib to 4 cm. below costal margin, nipple line. Considerable edema of feet and legs. White count 34,000.

Endocarditis, acute or chronic, would be a much more usual diagnosis to make in this case with decompensation, a loud transmitted murmur, with cardiac enlargement and leukocytosis. The apex in the sixth space, in the absence of nephritis, should not have permitted the diagnosis to be mitral regurgitation, unless that regurgitation was a relative mitral regurgitation associated with the left ventricular hypertrophy; or if so considered organic mitral disease, some other cause for the left ventricular hypertrophy should have been sought.

In 33 of the 36 cases in Group 2 the adherent pericarditis may be said to have been of the cardiac type. In three patients there was an associated perihepatitis and perisplenitis. In one, a boy of 7, the abdomen required frequent tappings; in the other two, women of 35 and 65 years, respectively, no ascites could be demonstrated. In one patient ascites was found post mortem.

No attempt has been made in the study of these cases to determine the clinical manifestations of the adhesive pericarditis. Analysis of the cases in Group 2 will be made later with this point in view.

From a study of these 62 cases, in which adherent pericarditis was present at post mortem at the Massachusetts General Hospital, two groups may be made, as in the accompanying tabulation.

GROUPING OF SIXTY-TWO CASES IN WHICH ADHERENT PERICARDITIS WAS PRESENT AT THE POST-MORTEM

	Group 1.	Group 2.
Cases without cardiac symptoms......	26	36
Average age, years....................	47.5	35.4
History of rheumatism	6	22
Endocarditis	6	27
Cardiac enlargement	not marked	marked
Average heart-weight, gm..............	352	592
Pericardial adhesions..................	less extensive	extensive
Pleuropericardial adhesions	rare	common

CONCLUSIONS

1. From a study of these cases, it may be said that adherent pericarditis may be impossible of diagnosis in cases like those of the first group unassociated with cardiac symptoms, cardiac enlargement or murmurs. The diagnosis under such conditions is unimportant, as in this type of the disease it probably contributes but little to the disability of the patient.

2. A second type in young adults, with a previous rheumatic history, with associated endocarditis, is serious. Adhesive pericarditis is overlooked because the coincident endocarditis appears in the foreground. Adhesive pericarditis should always be thought of in a young adult whenever rheumatism followed by endocarditis appears in the history, and especially considered when the cardiac failure is more marked or the cardiac enlargement more extensive than the endocardial damage seems to warrant.

3. More careful records should be made of the presence or absence of cardiac dilatation in cases of acute rheumatism without endocarditis or pericarditis.

377 Beacon Street.

THE INTENSIVE TREATMENT OF SYPHILITIC NERVOUS AFFECTIONS CONTROLLED BY EXAMINATIONS OF THE CEREBROSPINAL FLUID [*]

A PRELIMINARY REPORT

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LOS ANGELES

It is true that any method of treatment of syphilis will be judged eventually by its power to prevent the development of the so-called parasyphilitic and metasyphilitic affections, and its power to eradicate the infection in the central nervous system, and thus to cure or to arrest the progress of the disease in those patients in whom the late nervous affections have already developed. The degree of improvement must always depend upon the extent and the location of the destructive and sclerotic changes that have already occurred.

It has now been demonstrated quite certainly that the parasyphilitic and metasyphilitic affections are phenomena associated with active syphilitic infection localized either in the central nervous system or in the bloodvessels. The demonstration has been made not only by finding the Wassermann reaction positive in the blood or cerebrospinal fluid in a very large percentage of such cases, but also by finding the specific organisms of syphilis in the brain (Noguchi and Moore[1]) or blood-vessel walls (Longcope[2] and others) in a considerable percentage of the lesions examined after death.

The problems concerning the nervous affections are, therefore, three:

1. To prevent the localization of the infection in the central nervous system.
2. To discover such localization, if possible, before the parasyphilitic phenomena have developed.
3. To eradicate the infection, thus permitting the processes of nature to restore and reeducate the patient to whatever degree is possible.

The first problem scarcely needs discussion, for any treatment that is effectual in eradicating an established infection of the central nervous system will be effectual in preventing the localization there. It need be said only that the earlier the diagnosis is made and treatment established, the surer will be the power of the treatment to prevent such localization.

MATERIAL, TECHNIC AND CONTROLS

My study of the two other problems is based upon an analysis of the examinations of ninety-six cerebrospinal fluids obtained from seventy patients, and on the treatment of fourteen of those whose fluids showed evidence of syphilis. The fluids of these fourteen patients have been examined thirty-eight times. All examinations were made with reference to pressure (measured in millimeters in a capillary tube), cytology, butyric acid globulin test, and Wassermann test. A Wassermann test of the blood, also, was made in nearly every instance. The cells were counted in a Zappert ruled hemocytometer after mixing equal parts of cerebrospinal fluid and 0.6 per cent. acetic acid. Noguchi's butyric acid test was made with 0.2 c.c. of cerebrospinal fluid. In the Wassermann test of the blood, the acetone-insoluble fraction of beef-heart was substituted as antigen in the Wassermann system, and 6 antigenic units used; the quantity of each reagent in the original test was reduced to one-fifth; an extra tube containing only one unit of complement with two parts of serum was added; and native antisheep amboceptor was titrated with each test.

Each cerebrospinal fluid was carefully titrated with ten tubes; the first two tubes were controls and contained respectively 1 c.c. and 0.4 c.c. of cerebrospinal fluid with one unit of complement; the third and fourth tubes corresponded to the two test tubes of the Wassermann reaction, and in each were placed two units of complement; in each of the remaining six tubes one unit of complement was placed and the tubes were given respectively 0.2, 0.3, 0.4, 0.6, 0.8, and 1 c.c. of fresh undiluted, unheated cerebrospinal fluid. It should be noted that 1 unit of complement is 0.1 c.c. of a 1 to 10 dilution of guinea-pig serum. (Each day the complement was titrated.)

This quantity used with 1 c.c. of fluid makes an exceedingly delicate test, and one that must be watched and controlled with great care. If the reagents are skillfully titrated, however, if the test is well controlled, and if the cerebrospinal fluid is tested within a few hours after being drawn, so that it does not develop anticomplementary properties, the results are perfectly reliable.

Non-syphilitic patients: In the series of seventy patients there were twenty-six that were probably nonsyphilitic. Wassermann tests of the blood were made in eighteen; all were negative even in the tube containing two parts of serum and one unit of complement. The cerebrospinal fluid of all twenty-four caused no fixation of complement, even in the tube containing 1 c.c. of fluid and 1 unit of complement. The pressure was obtained in thirteen instances and will be tabulated in a later report. The cells were increased above eight in two cases of meningococcus meningitis, one of acute poliomyelitis (240), and one case of probable brain tumor (11 mononuclears). The butyric acid test was strongly positive in meningococcus meningitis, poliomyelitis, one case of Pott's disease, and the case of probable brain tumor. It was definitely, though weakly positive in a case of arteriosclerosis and nephritis and was associated with a cerebrospinal pressure of over 340 mm. and blood-pressure of 228. The other tests were all negative or doubtful positives.

These twenty-six cases serve merely as controls for subsequent groups. There is nothing in them of especial interest except, perhaps, the case of nephritis and arteriosclerosis with high cerebrospinal pressure and a positive butyric acid test, and the case of brain tumor (not yet proved) with a strongly positive butyric acid test and a slight increase of mononuclear cells. Nine of the fourteen pressure determinations were 200 mm. or greater.

EARLY DETERMINATION OF SYPHILITIC LOCALIZATION IN THE CENTRAL NERVOUS SYSTEM

The cerebrospinal fluid has been examined in eleven cases of tertiary, latent and treated syphilis and in five cases of miscellaneous and atypical syphilitic cases. In the eleven cases, the patients showed no symptoms definitely pointing to organic nervous trouble. The Wassermann test of the blood had been or was positive in all. The examinations gave the following results:

Wassermann test, butyric acid test and cell-count positive	1
Wassermann test and butyric acid test positive and cell-count negative	3
Wassermann test negative, butyric acid test positive and cell-count negative	3
Wassermann test, butyric acid test and cell-count negative	4

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[*] Read in the Section on Practice of Medicine of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

[1] Noguchi and Moore: Jour. Exper. Med., Feb. 1, 1913, p. 232.

[2] Longcope, Warfield T.: Syphilitic Aortitis; Its Diagnosis and Treatment. Arch. Int. Med., January, 1913, p. 15.

One of these patients with an indefinite history of syphilis eleven years before, had had a nervous breakdown one year ago from overwork, "nervous prostration." He had continued in a "neurasthenic" condition in spite of rest and travel and symptomatic treatment. There were no objective signs of syphilis or of parasyphilis, but his blood-test was strongly positive, and all three tests of the cerebrospinal fluid were strongly positive—0.1 c.c. of the fluid fixed 2 units of complement.

A patient with paroxysmal hemoglobinuria had no nervous symptoms. His blood gave an intensely positive Wassermann reaction, 0.1 c.c. of a 1 to 300 dilution fixed 1 unit of complement. His cerebrospinal fluid was positive to the Wassermann and butyric acid tests, but it required 0.4 c.c. of the fluid to fix one unit of complement. This case is a good demonstration of the absence of relation between the Wassermann reaction in the blood and that in the cerebrospinal fluid.

A patient with Argyll Robertson pupils and double vision had no history of syphilis and no other manifestations of the disease. He was a strong robust man and seemed perfectly healthy. The blood Wassermann test was suspicious and the cerebrospinal fluid gave positive Wassermann and butyric acid tests and showed 35 mononuclear cells per 1 c.mm.

It is well known that syphilitic infections of the central nervous system are far more difficult to eradicate than when the infection is located elsewhere, and that the blood Wassermann is far more easily made negative than that of the cerebrospinal fluid. Considering these facts and cases like the ones above noted one is led inevitably to conclude with Neisser[3] that "one ought not to stop treating any syphilitic patient, even if the reaction in the blood is negative, without an examination of his cerebrospinal fluid. True alterations in the central nervous system can exist without clinical manifestations of any kind, but which, discovered by the serologic, microscopic and chemical examination of the cerebrospinal fluid may be treated, and thereby ultimate and perhaps incurable aggravations may be prevented."

In the examination of the cerebrospinal fluid we unquestionably have means of discovering in most cases, whether or not the infection has localized in the central nervous system, and one or more of the three tests may remain positive long after the blood Wassermann has become negative. It is fair to assume that those patients with positive cerebrospinal fluids are promising candidates for the later organic nervous affections of syphilis, and if it is possible to change the fluid to normal they should be treated until the desirable end is accomplished.

TABES DORSALIS AND GENERAL PARESIS

In the incipient and atypical cases of tabes and paresis the examination of the cerebrospinal fluid is invaluable for establishing the diagnosis, and in the advanced cases it is necessary as a therapeutic guide.

In my series there are nineteen cases of tabes with twenty-eight spinal fluid examinations; ten cases of general paresis with twenty-three spinal fluid examinations. A Wassermann test on the blood was made in all nineteen of the tabes cases and was positive only three times, (15.8 per cent.). The test of the cerebrospinal fluid was positive eighteen times, (94.7 per cent.). The butyric acid test was positive seventeen times in seventeen tests, (100 per cent.). Cell counts were made in seventeen cases; the number of cells varied from 10 to 128 in 12 cases, (70.6 per cent.) and was below seven in the other five cases. The pressure varied from 80 mm. to 300 mm. with a mean of about 220 mm.

In the ten cases of general paresis, Wassermann tests on the blood were made nine times with only three positives (33.3 per cent.). The Wassermann tests and butyric acid tests of the cerebrospinal fluid were positive in 100 per cent. of the cases. The cells were counted nine times and were above 10 in only three cases (33.3 per cent.). The pressure varied from 140 mm. to 350 mm.

There is a decided difference between the percentages of positive findings in my cases and those of other workers, my blood positives being fewer while my cerebrospinal fluid positives are more numerous. The discrepancy in the blood findings is due probably to the fact that in many of my cases an examination of the cerebrospinal fluid was requested by the attending physicians because the blood Wassermann was negative, while the discrepancy in the findings in the cerebrospinal fluid is due probably to the fact that my Wassermann titrations were carried much further than is usually done, making the test more sensitive.

TREATMENT OF SYPHILIS OF THE CENTRAL NERVOUS SYSTEM

There are no detailed reports in the literature, as far as I have been able to examine it, of syphilis of the central nervous system thoroughly treated and controlled by repeated tests of the cerebrospinal fluid. In the few cases that do appear, details are lacking as to the number of injections of salvarsan given, the size of the doses, the use of mercury, or the technic of the Wassermann test especially with reference to the most important point of the actual quantity of complement used. Only one author has spoken of titrating the "antibody content" of the cerebrospinal fluid, and though he states how much cerebrospinal fluid he used, I cannot tell the quantity of complement. If I have interpreted him correctly, the last tube in my titrations is ten times as sensitive as his most sensitive test.

Temporary symptomatic improvement in the parasyphilitic affections has been seen with mercury and the iodids, with one or several injections of salvarsan, and there have been remissions even without treatment. To be sure, therefore, that symptomatic improvement is unquestionably the result of treatment, one needs very convincing evidence. This can be supplied best by careful repeated examinations of the cerebrospinal fluid. My treatment has consisted in intravenous injections of salvarsan and neosalvarsan combined with mercurial inunctions or "mixed treatment" to the point of tolerance.

The intravenous injections of salvarsan have been given at intervals of six weeks to ten days, governed according to the reaction on the part of the patient and the reduction in the strength of the tests of the cerebrospinal fluid. Occasionally neosalvarsan has been substituted. The size of the dose has usually been 0.6 gm., excpting first doses which sometimes have been 0.4 gm. or 0.5 gm.

The details of the cases are shown in the accompanying table:

In the twelve cases showing definitely positive Wassermann tests in the cerebrospinal fluid the mean reduction in the strength of the reaction was about 50 per cent. for every three injections of salvarsan. I have made it a practice to examine the cerebrospinal fluid three to four weeks after every third injection. If treatment is effecnosis to become evident means a general dissemination of the virus with probably either visceral or central system involvement with their attendant burdensome and tedious treatment. The importance of lumbar puncture in cases of syphilis, which Dr. Brem has emphasized, is becoming more and more recognized. The frequency with which an involvement of the central nervous system is demonstrable during the secondary period of syphilis makes it practically imperative that such a condition should be ruled out by objective evidence. The early recognition of secondary syphilitic meningitis is of primary importance inasmuch as this condition usually persists over a long period of time and in the end may be responsible for the syphilitic lesions of tabes and paresis.

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[3] Neisser: Les principes du traitement moderne de la syphilis, Rev. méd. d'Egypte, 1913, p. 9. Quoted by Henri Roger: Presse méd., April 6, 1913, p. 305.

Dr. R. C. Cabot, Boston: The brilliant work of Swift, at the Rockefeller Institute, New York, has not been referred to, nor the importance of treating these patients by salvarsanized serum injected into the spinal canal. Dr. Swift has used the cell-count, to which Dr. Brem did not refer, and has noticed after this method of treatment a diminished number of cells. We have been following out Dr. Swift's method at the Massachusetts General Hospital and have been impressed by the improvement in cases of tabes following the injection of the patient's own serum. After the patient has received salvarsan into his own blood, we bled him and 30 c.c. of his own serum are injected into the cord. The average dose, 30 c.c., given about once a week for a prolonged period, may strikingly ameliorate the condition of the spinal fluid, as found on puncture, and somewhat ameliorates the symptom.

It seems to me that the point which Dr. Brem has brought out, and which has been brought out by Dr. Dochez, is that we should make a spinal puncture in every case of syphilis.

Dr. F. F. Russell, Washington, D. C.: Dr. Brem has touched on one point, the examination of the cerebrospinal fluid in syphilis as a criterion of the cure of syphilis, and Dr. Cabot has just spoken of a standard of cure for syphilis. At present it seems to me that we might well talk about what shall be the standard of cure. We have four or five different tests to rely on, and it may be necessary to use them all; first, the length of time in which a man goes without symptoms; if a man goes without symptoms or a positive Wassermann, say for a year, that would be the first test; if at the end of that time he has a negative Wassermann, that is a second test; the third test would be a negative provocative Wassermann at the end of the year; the fourth test would be a negative luetin reaction. Dr. Brem and Dr. Cabot have proposed a negative cerebrospinal fluid, presumably at the end of the year. Thus we have five tests to be considered so that after a comparatively short time we can come to some agreement as to what shall be the standard of cure for syphilis.

Dr. A. J. Caffrey, Milwaukee, Wis.: Dr. Brem has had better results in fourteen cases of paresis than I have had in one case which I treated a few years ago. A man about 40 years of age gave a history of having had the initial lesion about seven years before. He had been treated at that time by a physician who later became paretic and is now in an insane hospital. He felt that his physician, who was insane, may not have cured him, and he had heard so much about salvarsan that he asked to have the treatment, which I gave him after having found a positive Wassermann. I gave the injection intramuscularly because at that time we were not using the intravenous method. Before he had the first injection, he had a morbid horror of approaching tabes; the examination showed no significant signs of tabes, but he had all the characteristic symptoms of incipient paresis. After the injection of salvarsan his condition improved for about eight days, but he lapsed back again into his morbid dread of approaching locomotor ataxia. I gave him a second injection after two weeks, but he became uncontrollable as an office case, so I sent him to a sanatorium where he attempted suicide by stabbing himself in the abdomen. I took him to the hospital and found that he did no damage to the intestine, the instrument having gone down between the coils of the intestine and slightly penetrated the omentum. He recovered from the wound completely and was ready to leave the hospital, but one day after he ate his dinner he fell over dead. Necropsy was refused, but I have always believed that the salvarsan set up some reaction in the brain which caused a blood-vessel to rupture.

Dr. James S. McLester, Birmingham, Ala.: In all cases of so-called parasyphilitic disease, my colleagues Dr. Ward and Dr. Toole, have followed the method of Swift. They first administer salvarsan intravenously, withdraw half an hour later a certain amount of blood and inject intraspinously 30 c.c. of serum so obtained. I cannot tell you their exact results, although I know in a general way that they are encouraging.

Dr. William Litterer, Nashville, Tenn.: The examination of the spinal fluid by the Wassermann test should be made in every case of syphilis before we can say that this disease is cured. I am greatly impressed with the Swift method in the treatment of cases in which a negative blood with a positive spinal fluid is recorded. This is certainly the logical means of treating these cases, especially since we know that very little salvarsan ever gains entrance to the subarachnoid space. This is due to the fact that the spinal fluid is a secretion and not a definite transudation. I have had only four cases in which I tried the Wassermann test with the spinal fluid, and I found that in one case only by the giving of salvarsan was I able to obtain negative results. The lymphocytes were decreased in all of these four cases, but I could not obtain a complete negative Wassermann except in one case. The other cases are under observation at present.

Dr. Walter V. Brem, Los Angeles: In my paper I should have discussed Swift's work, but my time was limited and inadvertently I did not refer to it. Swift's method of treatment may prove to be the method of choice. It is somewhat difficult, but if necessary it can be carried out. I am rather hoping that my method of giving the larger doses may prove as effective as Swift's. If it does it will, of course, be much simpler and be available for a much larger number of cases. I doubt whether there will be more danger attending it than there might be from Swift's method. The cerebrospinal fluids in our cases were examined with reference to pressure cytology, the globulin content and the Wassermann test, and all of these reactions must be negative before we feel safe. Dr. Russell brought out the fact that the spinal fluid should be examined at intervals during at least one year following cessation of treatment, and probably longer. That is the plan I am following at present.

THE VALUE OF ABDOMINAL MEASUREMENTS IN PREGNANCY *

A STATISTICAL STUDY

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Since 1904 it has been customary for the assistants and students in my clinic at the San Francisco Maternity to measure the height of the fundus uteri above the symphysis in all cases of pregnancy. Measurements have been made with a tape-measure, placing one end on the upper border of the symphysis and the other on the ensiform cartilage. The uppermost margin of fundus of the uterus is located and read off the tape. In this paper, an effort will be made to estimate the value of these measurements in so far as they relate to the size of the unborn child and to the probable date for delivery.

Some years ago Ahlfeld[1] measured with a pelvimeter, the height of the fundus uteri in a series of cases and

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* Read in the Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

[1] Ahlfeld, F.: Bestimmungen der Grösse und des Alters der Frucht vor der Geburt, Arch. f. Gynäk., bd. ii, 353, 1871.

concluded that from the twenty-fourth to the fortieth week the height of the fundus increased gradually from 15 cm. to 26.1 cm. He also made the valuable observation that while with the same measurement the weight of the babies varied, the length was very constant and was always twice the inter-uterine axis. But he did not associate these measurements with any rule for estimating the probable date for delivery.

Ahlfeld's work has been verified by Tramer,[2] Walraf,[3] Suttigen[4] and many others, but of late years so much attention has been given to estimating the size of the fetal head *in utero* by means of Muller's method of impression, or Stone's[5] modification of Perret's[6] method, that Ahlfeld's work has been neglected.

Height of Fundus	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	
Weight of Babies	1800	3170	2060	2940	3032	3500	2890	3430	3650	3628	3560	3380	4070	3580	4600	3870	3970	
	1700	2860	3660	3220	2480	3580	3420	4400	3490	4540	3820	3300	3980	4240	4260	3900	3630	
	3180	2570	1450	3050	2125	3150	2910	3100	2870	4780	4550	4540	3640	Twins	3740	4535		
	1815	2120	3080	3795	2850	2880	2800	2375	3290	2900	3700	3460	3870	Twins	3460			
		1960	2940	2840	3520	3790	2440	3160	3520	2960	3560	3820	3900	Twins	3800			
		2100	3020	3740	2960	2500	3040	3240	4180	3120	3310	3510	4810					
			2325	2660	2680	3390	3120	3200	3400	3270	3520	3030	4000					
				2560	3225	3570	2610	2600	3450	3950	3470	3660	4535					
				3130	2720	3520	3240	2970	3700	3350	3330	Twins						
				3340	2220	3580	3320	3720	3400	3720	3720	3570						
				3180	3500	3110	3150	3010	3100	3900	3100	3685						
				2720	3350	3980	3700	3340	3720	3570	4380	3880						
				2380	2880	3540	3870	3600	2670	2960	3210	3960						
				2410	3160	3550	3180	3150	3050	3720	3380	3375						
				3090	2680	3190	3100	3340	3000	2840	Twins	4195						
					2940	3290	3060	3440	3140	3175	3490	2660						
					2580	2870	3130	3735	3270	3800	4340							
					2720	2800	3000	3710	2930	3515	3960							
					3270	2680	3220	4000	3890	3175	3770							
					3005	3370	2920	2940	3560	3770	4110							
					3115	3140	3480	3470	3460	3460	3960							
					3400	2940	3530	3005	3200	3290	3655							
					3005	2400	2990	3515	3115	3715								
						3310	3600	3800	3630	3740								
						3210	3280	3275	3460	3935								
						3740	2140	3005	3460	3430								
						3030	3150	3400	2720	3770								
						3460	3490	3290	3460									
						3545	2835	3315	3115									
						2835	2720	3800	3570									
						3460	3630	3460	3345									
						3570	3175	2890	3740									
						3440	3430	4080	4140									
						2950	3880	2720	2720									
						3570	3145	3540	3540									
						3740	3545	3460	3630									
						3030	3260	2975	2890									
							3410	3960	3570									
							3175	3685	3175									
							3700	3230	4535									Total
Number of Cases	4	6	7	15	23	37	40	40	40	27	22	16	8	5	5	3	2	300
Average weight	2125	2455	2645	3005	2930	3275	3190	3360	3395	3555	3710	3620	4100	3910	3970	4100	3800	
Variation	1480	1190	2210	1415	1395	1580	1740	2025	1865	1940	1450	1730	1170	660	1140	665	340	

Chart 1.—Three hundred confinements. Height of fundus compared to weight of baby.

Suttigen[4] condemned the use of a tape-measure in measuring the fundus and stated very truly that the variations with a tape measure extended from 2 to as much as 13.5 cm. while with a pelvimeter, the variations were only from 2 to 5 cm. He observed that one of the chief causes for this variation was the contractions of the uterus. As the uterine contraction continues, the fundus rises higher and higher to subside at the end of the contraction to the original measurement. This is a very practical point and should always be taken into account in drawing conclusions from fundus measurements.

McDonald,[7] a few years ago, published a rule for estimating the period of pregnancy by measuring with a tape measure in a somewhat similar method to that which is described in the present paper but, unfortunately, his paper lacks statistical presentation and has overlooked the important point that as pregnancy advances the rate of uterine enlargement lessens. His rule is to divide the height of the fundus in centimeters by three and one-half in order to obtain the lunar month of pregnancy. About the same time I published a somewhat similar rule based on clinical observations, but also without statistical study. My rule was to add four to the height of the fundus as measured in centimeters, which would equal the probable week of pregnancy.

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[2] Tramer, D.: Ueber die Bestimmung der Grösse des Kindes vor der Geburt, Bern, 1881.

[3] Walraf, J.: Ueber Lingemessung der Frucht während des Geburtsactes, Berlin, 1873.

[4] Suttigen, V.: The Means of Ascertaining the Length of Gestation by Measurements of the Fetus and Gravid Uterus during the Second Period of Pregnancy, Obst. Jour. Great Britain, London, 1875-76, iii, 397.

[5] Stone, W. S.: Antepartum Measurements of the Fetal Head, Med. Rec., New York, Nov. 4, 1905, p. 725.

[6] Perret: Bull. Soc. d'obst. de Paris, 1898, p. 58.

[7] McDonald, E.: Mensuration of the Child in the Uterus with New Methods, THE JOURNAL A. M. A., Dec. 15, 1906, p. 1979; The Duration of Pregnancy with a New Rule for its Estimation, Am. Jour. Med. Sc., September, 1910.

During the last five or six weeks of pregnancy it is surprising how closely both these rules will compare to Naegle's rule, but they both have the same basic error and are not accurate in the period from the twenty-fourth to the thirty-fourth week.

The literature is overburdened with many fantastic rules for estimating the weight of the unborn child such as that of A. Goenner, who stated that the weight of the unborn child could be estimated by measuring the foot, and such problems in mathematics as are presented by Roberts,[8] Tuttle,[9] etc.

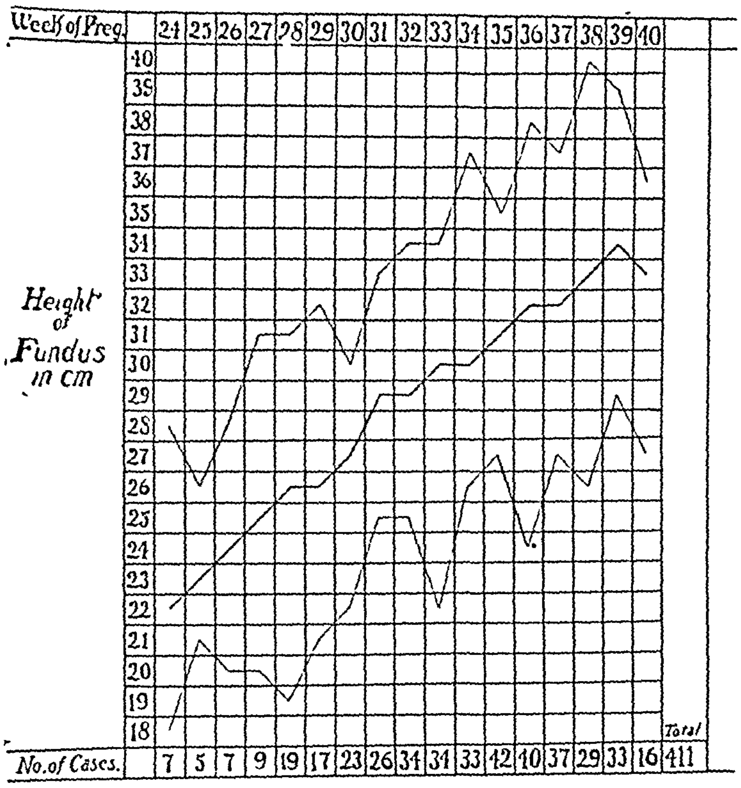

Chart 2.—Fundus measurements in series of 411 pregnancies. Upper and lower curves show limits of variations—middle curve shows average measurements.

Consequently, it is with many misgivings that the present statistical paper to estimate the value of uterine measurements is presented. Over two thousand records of confinement have been reviewed. On Chart 1 will be found the weights of babies taken immediately after delivery in a series of 300 labors where the height of the fundus and the degree of settling, or in other words, the total uterine axis was carefully observed. It will be noted that 157, or over half of the series, give fundus measurements between 34 and 37 cm. with average weights for the babies, between 3,275 and 3,395 gm. This might be considered a rough standard for average normal babies. Eighty-eight give fundus measurements between 38 and 45 cm., with average weights for the babies between 3,555 and 4,100 gm., besides five cases of twin delivery. This is a rough standard for over-maturity of the child. Fifty-five fundus measurements averaged betwen 2,175 and 2,930 gm. This also could roughly be stated as a standard of imperfectly matured babies. With experience, one can utilize these measurements to advantage in certain cases of toxemia, nephritis, heart-disease, etc., to determine the best period for the induction of premature labor or of the advisability of inducing labor at term; but unfortunately the possibility of error in exceptional cases precludes the utilization of these measurements in the management of contracted pelvis. It will be seen on the chart that with the same abdominal measurement, there is a variation in the weight of the child in exceptional cases of as much as 1 or 2 kilos. A great deal depends on the care with which the measurements are made, on the condition of contraction or relaxation of the uterus, on the skill of estimating the degree of settling and on the thickness of the abdominal walls, as well as the accuracy in diagnosing such conditions as hydramnios and multiple pregnancy.

Chart 2 presents the measurements of the uterus made at various weeks of pregnancy in a series of 411 patients. The patients in this series knew the date of their last menstrual period, gave birth to normal-weight babies within seven days of the expected time according to Naegle's rule and were not complicated with hydramnios or multiple pregnancy. The measurements begin with the twenty-fourth week of pregnancy and extend to the forty-first week. For each week the number of patients measured, which vary from five to forty-two, is stated on the charts. The upper and lower curves represent the greatest and the least measurements while the middle curve represents the average measurement obtained each week. The variations are the same that Suttigen noted and are due not only to personal equation, but to contractions in the uterus caused by manipulation of the fundus. I have tested this in personal cases and find that with a single examination these errors of variation are always possible, but with care and with repeated examinations at intervals, averages according to the middle curve are very constant.

Comparing these curves with the results obtained by Ahlfeld[1] and Suttigen[4] in a similar series of cases measured with a pelvimeter, it will be noticed that, even though the error of variation is less when measurements are made with a pelvimeter, the rate of increase noted from week to week is so small that no practical rule for estimating the period of pregnancy could be devised. In other words, measuring with a tape measure magnifies the results obtained with a pelvimeter (not only the errors but the averages as well) and permits of utilizing these measurements in a practical way.

In studying the curve of the averages, it will be noticed that there is a gradual increase in the height of the fundus from the twenty-fourth to the thirty-sixth week; after that, an irregular increase to the thirty-ninth week, and then a sudden drop to the forty-first week. The irregularity after the thirty-sixth week can be accounted for in the settling, which also causes some of the errors of variation noted throughout by the upper and lower curves.

Comparing the known week of pregnancy with the average measurements of the height of the fundus, it will be noted that between the twenty-fourth and twenty-eighth week or during the seventh month, the fundus measures 2 cm. less than the week of pregnancy; between the twenty-ninth and thirty-third week, or roughly the eighth month, the fundus measures 3 cm. less than the week of pregnancy; between the thirty-fourth and thirty-sixth week, or in the ninth month of pregnancy, the fundus measures 4 cm. less than the week of pregnancy;

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[8] Roberts, R. C.: The Uniform Lineal Growth of the Human Fetus, Lancet, London, Feb. 3, 1906, p. 295.

[9] Tuttle, L.: The Relation Between Weight and Age in the Fetus, The Journal A. M. A., Sept. 9, 1908, p. 919.

and after the thirty-sixth week, or in the last month of pregnancy, the fundus measures 5 cm. less than the week of pregnancy.

Transposing these figures, it is easy to compute a rule for estimating an unknown week of pregnancy from the measurements of the height of the fundus. This has been done and has been found of considerable value, particularly in clinic patients, in whom so often no menstrual history can be obtained. The rule is: Measure with a tape measure the height of the fundus above the symphysis in centimeters, making allowance for settling when present, and add two to measurements between 22 and 26 cm., three to measurements between 26 and 30, four to measurements between 30 and 32 and five to measurements over 32, *which sum will equal the probable week of pregnancy.*

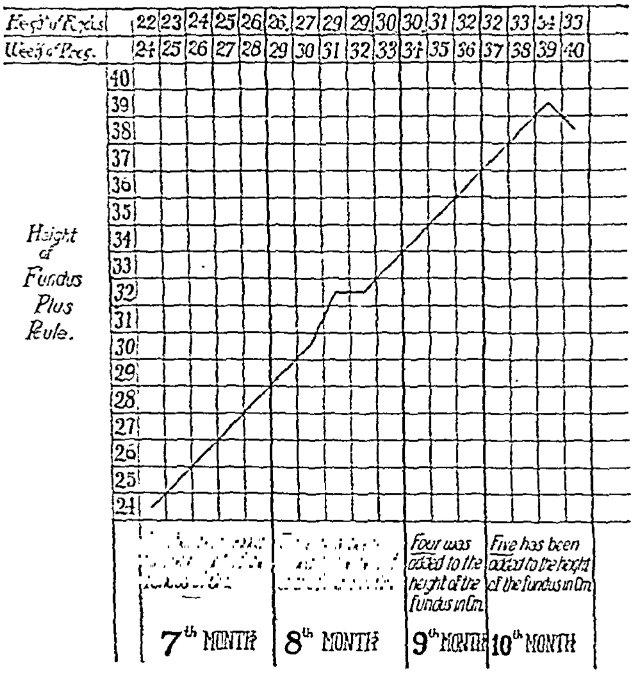

Chart 3.—Application of rule to measurements of Chart 2.

In Chart 3 the rule just stated has been applied to the measurements shown in Chart 2. It will be noted that with one exception, the estimated week of pregnancy corresponds exactly with the known week of pregnancy to the thirty-ninth week. It will be found that, with care, it is possible, as illustrated in this paper, to estimate accurately the probable week of pregnancy from the fundus measurements and in about three-fourths of all cases to estimate as closely as with Naegle's rule the date for the probable delivery.

CONCLUSIONS

Abdominal measurements are of value in estimating the degree of maturity of the unborn child. It is possible to estimate with considerable accuracy the probable week of pregnancy from accurate measurements taken with a tape measure of the height of the fundus above the symphysis.

Lane Hospital.

ABSTRACT OF DISCUSSION

Dr. Frederick E. Leavitt, St. Paul, Minn.: I have never accustomed myself to the use of the tape measure in the estimation of the size of the abdomen. I have depended rather on my own judgment and the estimate made from the manual examination. Dr. Spalding stated that in three-fourths of the cases it was possible in this way to estimate the date of labor correctly. From my own experience I think that I could strike it a little closer than that by estimating the probable date of labor from the date of the last menstruation. I do not see that there is any particular advantage in these abdominal measurements when we have accurate dates as to the last menstruation or the probable time of fertilization. The thing which interests me in abdominal measurements is to find out the proportions. The fetus is largely an unknown quantity, and in considering whether a patient is going to have a difficult or easy labor it is desirable to know how large the fetus is and whether or not it is out of proportion to the size of the mother. If the measurements indicated will help us, the idea is an advantage and of more importance than estimating the probable time of labor from dates. I have in mind several instances in which measurements of this kind would not have been of much value. In a family of two or three sisters and nieces there is a tendency to deliver short of full-term pregnancies. Some have gone thirty-four weeks, quite a number thirty-six, but none the full forty weeks. In these cases the measurements would not have helped to decide the date of labor.

Dr. E. Gustav Zinke, Cincinnati: A good obstetrician always regrets to accept a case of labor at, or just before, labor has begun. Some of the questions to be determined beforehand are: Is the patient pregnant? If pregnant, can she give birth to a child at full term? If so, what is the position of the child *in utero?* What is the general health and condition of the patient? And many other questions of great importance. Unfortunately, there are many who practice obstetrics who do not take the necessary care. It is this negligence which frequently gets both practitioner and patient into trouble. There is really no excuse on the part of the obstetrician, who is "engaged" long before labor, not to know the case before him and whether or not he will have a stormy time. Are the kidneys doing their duty? Are the emunctories of the body in perfect order? These queries bear significantly on the course and treatment of pregnancy and of labor. He who studies his cases carefully will not be taken by surprise.

Dr. A. B. Spalding, San Francisco: I think that we all realize how often women do not know the time of their last menstruation. I have seen a great number of charts which state that the labor is two months past the expected date for delivery. Again, when treating patients of a higher class—and the two classes that receive good service are the very poor and the rich—it will often be noticed that the pregnancy has run over the expected time for delivery. When pregnancy runs over, we should measure the height of the fundus as well as the pelvis. These measurements are of particular value in the class of patients who rest and eat too much. We have at our disposal good methods for the induction of labor at any time we desire, and that time should be when we think the child is large enough to survive and small enough to do the least injury to the mother's genital organs. In patients with habitual short-term pregnancies, we can measure the baby *in utero* and if we find that it is too small we can overfeed the mother and get it up to a normal weight. The operation for preventing prolapse of the uterus is of great interest to all of us. One of the best methods to prevent prolapse is to measure the abdomen every two or four weeks during the latter weeks of pregnancy, in order to know when the baby is fully developed and, at the same time, not so large as to cause serious injury to the woman's organs during labor, which will require subsequent serious surgical work or, more often, years of misery for the woman. It is the shame of obstetricians that so many of these cases go to the gynecologist afterward. There is no reason to my mind why patients should leave the hands of the obstetrician with damaged or diseased abdominal or genital organs if he does his work completely and properly. That is why I have presented this simple obstetrical paper. It is in the hope of encouraging enthusiasm for prophylactic gynecologic work rather than enthusiasm for repair work on women after years of misery due to poor obstetrics.

THE ESSENTIALS OF SANATORIUM TREATMENT OF TUBERCULOUS GRAVIDAE AND PUERPERAE AND THEIR CHILDREN *

CHARLES S. BACON, M.D.
CHICAGO

There are about 32,000 tuberculous women pregnant every year in the United States. Between 44,000 and 48,000 women of child-bearing age die of tuberculosis every year. Probably one-fourth of them are puerperae or have passed through pregnancy during the year, or, in other words, the gravidae and puerperae furnish one-fourth of all deaths from tuberculosis of women of child-bearing age. From this it also follows that about one-third of the pregnant tuberculous women die within a year of their labor. Of 10,000 children under 5 years of age who die of tuberculosis every year, three-fourths are born of tuberculous mothers.

These data show a part but not all of the bearing of pregnancy on the tuberculosis problem. Besides the increased loss of life among the tuberculous due to pregnancy, there is increase of infection both among the attendants, relatives and associates of the mothers and among the children. The gravidae and puerperae constitute an important factor in keeping alive the germ of tuberculosis and preventing the eradication of the disease. This factor has not been sufficiently recognized in the past, if we consider the means hitherto employed to combat it as an index of the general appreciation of the importance of the factor.

The proper management of the tuberculous gravida and puerpera and her child is that which carries the woman through labor and the lying-in period and leaves her from two to four months later in as good condition as she would have been in had she not been pregnant, and presents the child at that time to its parents and to society uninfected. This means considerably more than the ordinary care received by the average obstetric patient. It means a close watch of pregnancy, conservation of the strength of the patient and timely interference if necessary. It means the most skilful conduct of labor, through which the patient passes with no unnecessary loss of blood or of strength and with no risk of infection. It means a supervision of the puerperium to prevent as far as possible the exacerbation of the disease which is so common at this time. It means the separation of the child from the mother and caring for it as long as necessary. If the child is premature or feeble, incubation may be required at first. An incidental but very important feature of the management thus outlined is the education of the mother and her relatives.

We are of course considering only cases in which there is no therapeutic interruption of pregnancy. Possibly in 10 per cent. of all pregnancies in tuberculous women, or in 3,000 a year in the United States, therapeutic abortion is indicated. In the very great majority of cases, however, we must face the problem of a proper conduct of these patients through labor and the puerperium.

The obstetric management above outlined can be carried out in a private house only with considerable difficulty. It requires in the obstetrician peculiar skill, training and patient persistence. It demands likewise similar qualifications in the nurse. It is possible only among well-to-do patients who are sufficiently intelligent to agree to the regimen required. Probably not more than 10 per cent. of the 32,000 tuberculous gravidae found yearly in the United States could be ideally managed in their homes.

The labor can be conducted better in a maternity hospital or in the maternity department of a general hospital than in the home, but the conduct of the latter part of pregnancy and a long puerperium, which are at least as important as the conduct of labor, cannot be provided in such a hospital. Moreover, hospitals hesitate to admit patients infected with tuberculosis.

Hence comes the necessity for a maternity department in the tuberculosis sanatorium. We believe that three-fourths or even nine-tenths of all tuberculous gravidae should be cared for in such sanatoriums, and we insist that such care is necessary for at least one-third of these patients in order to protect them and society. This would mean that in the United States about 10,000 tuberculous gravidae should be sent to sanatoriums. To show the need of institutional treatment of the poor it might be stated that about eighty to one hundred pregnant women are included in the 8,500 patients who last year applied to the dispensary department of the Chicago Municipal Tuberculosis Sanatorium. All of these pregnant women should be cared for during the latter part of pregnancy and for some time after labor in a sanatorium.

Up to the present time there has been no provision made for these patients either in this country or in Europe. On the contrary, all institutions have practically excluded pregnant women. In the United States among the 30,000 to 40,000 hospital beds for consumptives not one is available.

This situation is probably due in part to the fact that hitherto this feature of the tuberculosis problem has not been emphasized, and in part to the supposed difficulty of providing a maternity department in connection with a general tuberculosis sanatorium. It is especially the object of this paper to call attention to the ease with which such a department could be provided. The essentials of sanatorium treatment are few and simple and not expensive. They can be provided in any large institution with little trouble and cost. Every state or municipal institution should certainly supply them, for the patients coming to these institutions are especially in need of sanatorium care. Many of these patients already have one or more small children. This is one of the great difficulties in securing proper sanatorium care for them. The mother cannot and will not leave her little children at home or elsewhere to the care of relatives or friends. Careful examination will show usually that the children are already infected. Any adequate solution of the problem must provide for these children.

The Chicago Municipal Tuberculosis Sanatorium which is now under construction has provided an obstetric department that may be taken as an illustration of what can be accomplished without making any material change in the plans of the institution. This institution is located in the outskirts of the city on a half section of land and will provide for 850 patients. Through the center of the grounds extend the four main buildings, the administration building, dining rooms, the infirmary and the power-plant. On each side are located about twenty open-air cottages, those for the women being on the right hand or south side. The infirmary is a two-story building built in an H-shape, the south side being used for the women. In the infirmary are housed the patients that are unable to be around. In this infirmary is located the nursery and confinement room of the

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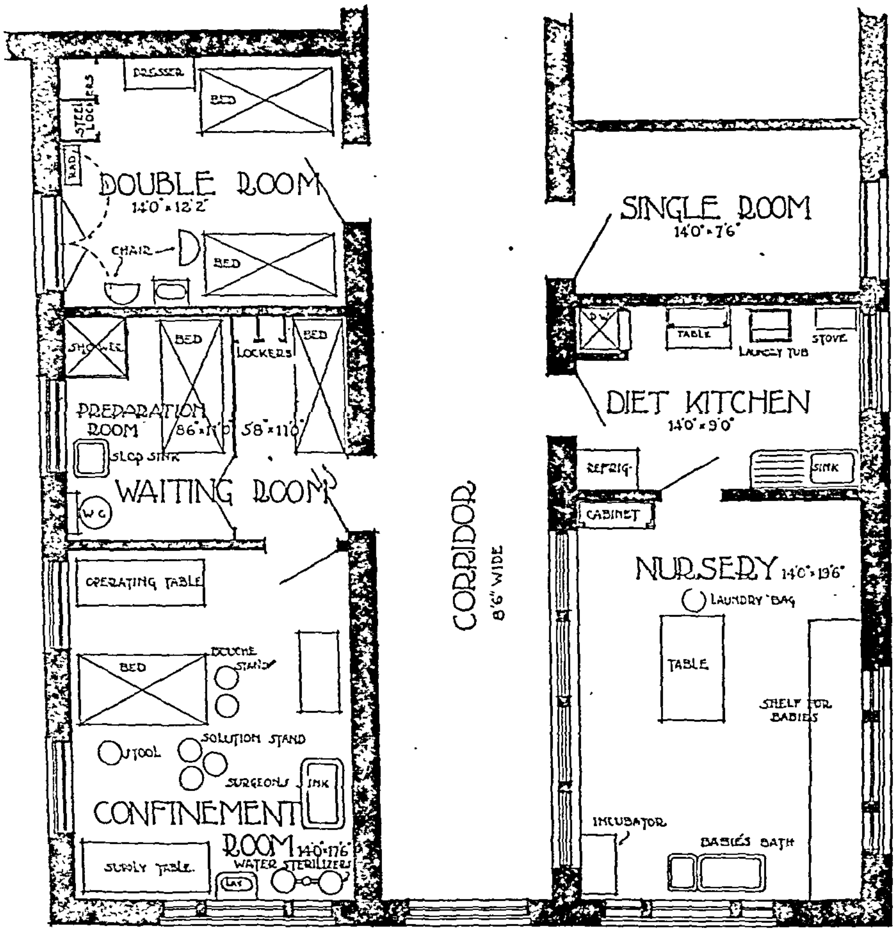
* Read in the Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

maternity department, as well as the rooms for small children.

Before describing the arrangement further let us consider what is needed in the maternity department of a tuberculosis sanatorium. Five things will be required: (1) provision for gravidae; (2) a confinement room; (3) provision for puerperae; (4) a nursery; (5) a *children's department.*

Both gravidae and puerperae can be housed in the cottages or in the infirmary. If the pregnant women are able to walk around they can remain in a cottage near to the infirmary. The only especial provision required is, perhaps, that they be provided with an exercise place that is somewhat secluded, and this can be done by fencing off a section of the grounds with shrubbery. As soon as a puerpera is able to be around she may also go to a cottage.



Plan of maternity ward infirmary group, City of Chicago Municipal Tuberculosis Sanatorium.

The confinement and preparation rooms are like similar rooms in any hospital and are necessarily located in the infirmary.

The children's department, where the small children of the gravidae will be kept, is on the second floor of the infirmary above the obstetric department. There are rooms, wards and sun parlors in the porches so planned that the more serious cases can be separated from the light or doubtful infections.

The essential feature of the plan is the nursery. This should be on the sunny side of the building and should be well heated and ventilated. It should be separate from the mothers but located near them. It should provide at least 16 square feet of floor space, or 160 cubic feet of space, for each baby.

A study of the plan will show how these features are provided in the nursery of the Chicago institution. Two rooms, a nursery 14 by 20 feet and a nursery diet-room 14 by 9 feet, are located in the southwest corner of the women's part of the infirmary. To separate the babies from the mothers and yet keep them contented is the difficult problem. This is accomplished by having a glass partition between the corridor and the nursery so that the mothers can see their babies during the bathing or at any time.

The heating plant will furnish the nursery any degree of heat required. An incubator will be installed for premature or especially feeble babies.

In feeding the babies it is planned to utilize the mother's milk as much as possible. Inoculation and other bacteriologic tests of the milk will be made to determine whether the milk from a mother is free from tuberculosis germs or not. In case it is safe, and if the condition of the mother allows lactation, her milk will be obtained by hand milking or with a pump. This milk will be preserved in the diet room and fed to the child, supplemented by such artificial feeding as may be required.

This nursery will hold about eighteen babies, allowing each over 16 square feet of floor space and 176 cubic feet of space. Mothers and babies should be kept three months, and this would give a capacity of about seventy-two patients a year. If the mothers can be induced to remain only two months, as will probably be the case, the capacity of the nursery will be 108 a year. The capacity for gravidae and puerperae is unlimited, because any of the beds of the institution can be used by them. It is predicted that the applications for the first year or two will be about 100, or about one-eighth of the tuberculous gravidae of Chicago. Later, if the number increases, the nursery can be enlarged by using the adjoining rooms on the other side of the diet-room.

Eventually it may be desirable to erect a separate building for the maternity cases. The space provided in this pioneer plan, and also the equipment, is the minimum. Of course it is not pretended that an ideal nursery is provided. It is claimed that for the cost it is sufficient and eminently practical.

The accouchement room, with the adjacent preparation room and waiting-room, can be used not only for confinements, but also for induction of abortion when this operation is indicated. Other clean obstetric or surgical operations might also be made in this room in order to utilize it to its fullest extent.

In the hygienic and dietetic management of the pregnancy and the puerperium the same principles apply as in the management of any other tuberculous patient. Rest, massage, respiratory and general exercises, recreation, sleep, feeding, control of excretions, all must be acromegalic changes, such as a thickening of the bone, enlargement of the sinuses, mandibular prognathism, etc.

Especial attention should be called, according to Schüller, to the development of the so-called sphenoparietal sinus—a venous channel connecting the sinus cavernosus with the convexity of the skull. In big tumors of the sella this sinus is often enlarged, which can be explained by pressure of the growth on the sinus cavernosus. In normal persons, however, one must remember that a large sphenoparietal sinus is occasionally to be found; so that this condition must always be interpreted with a certain amount of caution.

In tumors of the acoustic nerve, a rather characteristic change in the dorsum sellae has been observed. These tumors sometimes produce not only a thinning of the dorsum sellae, as in other extrasellar growths, but also a rather characteristic tendency of the dorsum sellae to incline forward. This fact enables us at times to make a diagnosis of an acoustic tumor from the roentgenogram, especially when these changes of the sella are combined with the described enlargement of the meatus acusticus (Henschen).

All these examples show that changes of the sella turcica in size and shape occur rather frequently in conditions other than true pituitary tumors; that is, in tumors in the neighborhood of the sella turcica as well as in tumors without any topographic relationship to the hypophysis and in cases of increased intracranial pressure due to internal hydrocephalus. On the other hand, the great influence of the other ductless glands on the development of the pituitary gland and on the secondary changes of the sella turcica has been demonstrated. These facts prove that not every change in the sella turcica is necessarily to be interpreted as a result of a primary pituitary disease, a fact which I hope I have emphasized especially in these brief remarks.

A COMPARATIVE STUDY OF ANTIGENS FOR THE WASSERMANN REACTION[*]

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AND
F. W. BAESLACK, M.D.
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HISTORICAL REVIEW

In 1901, Bordet and Gengou published the method for complement fixation, which was designed for the purpose of detecting antigens; that is, such bodies as are capable of producing antibodies, as well as a definite group of serum substances, probably amboceptors, the nature of which is not yet determined. It is possible by this method to determine, by the use of a known antigen, whether a certain serum contains the specific amboceptor, or reversely, one may determine by means of a known serum whether the substance used as antigen contains the antigen bodies. Neisser and Sachs proposed the use of this method for the differentiation of albumin. Wassermann, Neisser and Brück were able to demonstrate, in the serum of monkeys which had been previously treated with extracts of syphilitic organs, the presence of substances which gave complement fixation with syphilitic extracts. Detre, as well as Wassermann, Neisser, Brück and Schucht, found the same substances in the serum of syphilitic patients. Their early experiments, however, gave very inconsistent results. Citron was the first to recognize that the amounts of antigen and serum employed by the former authors had been too small and that the influence of the specific medication on the reaction was unknown to them.

Porges and Meier, von Landsteiner, Müller and Pötzl and later Yamanouchi and others pointed out independently that a substance could be obtained by extracting syphilitic and normal human liver as well as other organs with alcohol, which, when mixed with the serum of syphilitics, gave rise to complement fixation, and which to a certain degree could replace the syphilitic antigen. Porges and Meier, as well as Landsteiner, incline to the view that the alcohol-soluble substance is a lipoid closely related to lecithin, while Levaditi and Yamanouchi ascribe less significance to the lecithin and consider the bile salts as the important substances. The complement-fixation tests carried on by Wassermann and Citron with various colloidal substances such as glycogen, albumoses, peptone, lecithin, oil and gelatin, as well as the experiments of Landsteiner and Stanovic with other colloids, led Citron and Wassermann to the assumption that the cause of the complement fixation is a chemicophysical change of the molecule due to its entering into combination with some other substance. The experiments of Seligmann also prove that in colloidal reaction with or without precipitation complement may be absorbed. The disappearance of the complement is not due to the molecular condition as such, but is due to the changed condition of the colloids. While this does not offer any explanation of the specific immunity reaction, it shows that aside from the immunity reaction there coexist other definite chemical reactions which cause the disappearance of the complement. This in no way alters the great value of the complement-fixation test for the biologic diagnosis of infectious diseases, for it is the special property of immune serums to influence to a greater degree that colloid which is their antigen.

These findings induced Wassermann to separate the complement fixation in syphilis from the generally accepted antigen-antibody hypothesis for other infectious diseases, for he assumed that all antigens must be albumins or derivatives of albumins, without considering that some lipoids or lipoid-albumin combinations might be antigens also. The experiments of Metchnikoff and those of Deyke Pasha and Reschad Bey point to the fact that it is possible to stimulate the organism to the formation of reacting agents, similar to antibodies, by the injection of fat-like substances. The cobra-lecithin experiments should also be mentioned in this connection. It was pointed out by Citron that the injection of animal and other poisons with lecithin causes the formation of toxolipoids which may act as antigen, that is, produce antibodies. Such antibodies against the syphilitic toxolipoids may have a lipoidophil group which is brought out in the admixture with lecithin.

The fact that the serums of luetic patients are rich in ferments capable of splitting certain fats and lipoids and the presence of such ferments to a lesser degree in the serums of patients suffering from other infectious diseases, such as leprosy, tuberculosis, scarlet fever, etc., may be the reason why such serums react with syphilitic antigen. Thus it is possible that in the Wassermann reaction we are dealing with several distinct complement-fixation reactions of entirely different character, one of which may be specific.

In spite of the fact that the Wassermann reaction is as yet unexplained, it is widely used for the diagnosis of syphilis. The aqueous extracts of the syphilitic liver and spleen were, on account of their instability, displaced by alcoholic extracts of these syphilitic organs. The difficulty of obtaining syphilitic fetal tissue also had its influence in stimulating the search for some substitute as antigen. More recently acetone has been employed as extractive, because it is supposed that such extracts contain substances which approximate the syphilitic antigen more closely, and thus permit of a more delicate reading of the test. It does not fall within the scope of this paper to review the extensive literature dealing with the various antigens employed by the experimenters in this field of research. The extracts employed have been either specific, such as were obtained from syphilitic tissues by the use of water, alcohol, or acetone as extractives, or they have been non-specific extracts made from heart muscle, liver and brain of guinea-pigs and cattle. Aside from these extracts, combinations of chemical substances, such as Schurmann's and those given by Sachs and Rondim, have been employed as antigens in this reaction. From this it appears that normal tissue contains substances, possibly to a lesser degree, as has been shown by Much, which have the power to absorb the complement.

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[*] Read in the Section on Dermatology of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

Aside from the use of artificial antigens, there have been other modifications of the Wassermann reaction; however, none of these modifications have as yet increased the clinical value of the test, nor has any attempt to simplify the method been suggested which does not at the same time sacrifice considerably its accuracy.

In the course of the inoculation experiments of four strains of the *Spirochaeta pallida,* which have been carried on in rabbits at the Research Laboratory of Parke, Davis & Co., it seemed that the white, glistening gumma, which contains practically nothing but spirochetes and the products of their metabolism, might offer material for the preparation of antigen for the Wassermann reaction which would possess more of the specific antigen bodies than any other antigen yet used for such purposes. The antigen thus prepared was made from lesions caused by the four strains of the organisms. We had, therefore, a specific and to some degree polyvalent antigen. The four strains of *pallida* have been transplanted now for over a year, and the lesions which these organisms produce are free from secondary infection. No antigen was prepared from cultures of the organism, since the culture does not afford a sufficient amount nor could the mediums in which the *pallidae* were growing be separated from them. It seemed that the extract of organisms and culture mediums would afford us no more specific antigen than had been employed by others thus far. The syphilitic gumma frequently replacing one half and more of the testis seemed better suited for this purpose, since all the non-infected tissue could be trimmed away, and only the grayish-white gumma used. The term "gumma" is here used not in its strictest sense. The lesion produced by the action of the *pallida* in the gland proper is one of clearly circumscribed mucoid degeneration. Superficial chancres were not employed since these are usually contaminated with other bacteria.

The antigens were prepared as follows: The lesions were carefully freed from the tissue not involved, ground up fine and weighed. The material was then frozen in an ice and salt mixture, and dried *in vacuo* over sulphuric acid. When completely dry, it was placed in physiologic salt solution to which 0.3 per cent. trikresol had been added. The ratio of tissue to salt solution is 1:4. This tissue suspension was shaken for twenty-four hours and placed in a sterile amber glass bottle in the refrigerator for three days to allow the tissue to settle. This was our aqueous antigen.

The alcoholic antigen was prepared in the same way that the regular stock syphilitic fetal liver antigen is prepared.

The acetone extract was prepared by placing the ground-up and dried tissue into Merck's C. P. acetone, taking for every gram of tissue 20 c.c. of acetone. This was allowed to stand in a dark bottle at room temperature for eight days, filtered and evaporated at 37 C. (98.6 F.).

The residue was taken up with C. P. methyl alcohol, one hundred parts of the methyl alcohol being used for every gram of residue. The acetone residue contains a substance which is not soluble in methyl alcohol. The methyl-alcohol-soluble extract is admixed with ten times its volume of physiologic salt solution for the test.

These three extracts of gumma of rabbits were tested against the alcoholic extracts of syphilitic fetal liver, and in our last experiments, the acetone-insoluble portion of beef heart.

Practically every antigen has the power to bind some complement. And the reason for the diversity of results obtained by some investigators on one and the same serum does not lie so much in the method employed as in the proper titration of the extract employed as antigen.

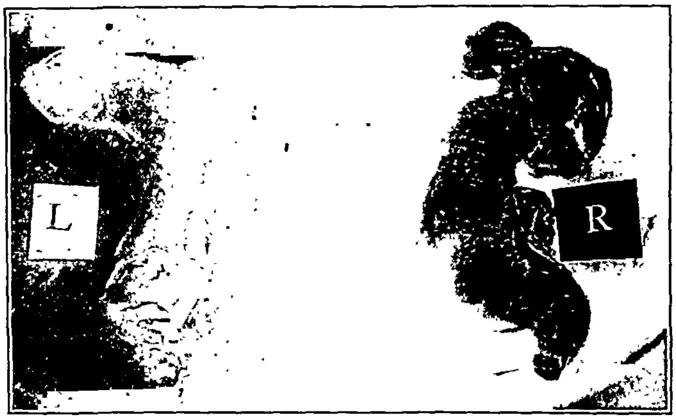

Fig. 1.—Syphilitic gumma of testis of rabbit from which antigen was prepared.

The value of a certain extract is usually determined by a preliminary experiment, usually according to Wassermann, in which a unit of the antigen gives complete fixation when admixed with a unit of luetic serum, while normal serums give a negative reaction. Any antigen fulfilling these requirements is considered satisfactory for this reaction.

If increasing doses of an antigen are tested for their activity in the seroreaction in syphilis, then it is shown that very small amounts will not bind the complement even in cases of florid syphilis. As the dose of the extract is increased, the fixation of the complement occurs with greater frequency, so that serums of latent syphilitics also react. If the amount is increased still more, the serums of patients not syphilitic will give positive reactions. And if the dose of the extract is carried still higher, we find that serums of normal healthy individuals give the reaction. The amount of antigen is then able to bind all the complement. It thus becomes evident that only such amounts of antigen should be employed in syphilis as will bind the complement only with luetic serums. Thus the Wassermann reaction is specific only within certain limits of the doses of antigen. For this reason the extracts were tested for their power to bind complement.

Increasing amounts of the extract are placed with the amount of complement usually employed in the sero-reaction in the incubator, then amboceptor and sheep blood corpuscles are added. For the test only one-half of that amount is used, which clearly indicates fixation (*Eigenhemmung*).

DETERMINATION OF THE SENSITIVENESS

In the serodiagnosis of syphilis, it is not so much a question of obtaining fixation of complement with undoubted cases of syphilis, as of determining a fixation of complement in the doubtful cases, which determine for or against syphilis. Complete binding of the complement is practically uniform with all extracts, but the cases demanding especial attention are those which show only partial complement fixation. Such cases may be overlooked by an observer who does not work with a sensitive antigen, for which reason it is not advisable to take the serum giving a strongly luetic reaction, for a positive control, but one which lies on the border-line, that is, serums that give a weak positive reaction, such as latent luetics, and those having sclerosis. Such serums are tested with varying amounts of extract according to the usual method, beginning with minute dilutions of antigen to the largest permissible.

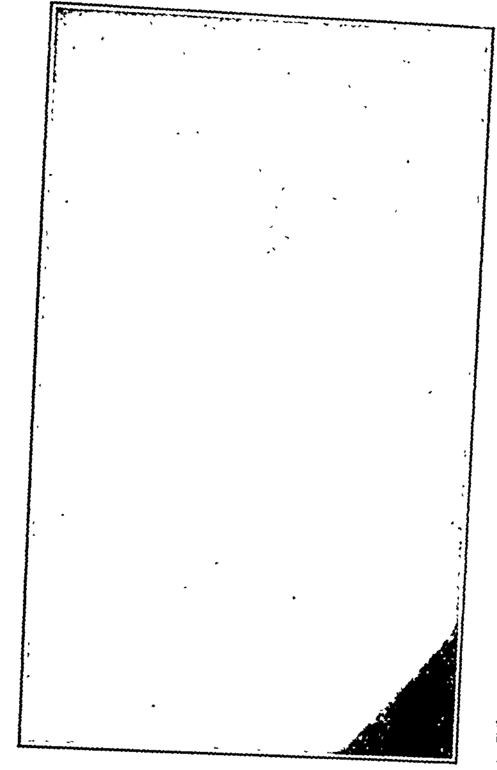

Fig. 2.—Luetin reaction obtained from gumma in rabbits used for the preparation of antigen. Control in center.

DETERMINATION OF THE SPECIFICITY

It is evident that for this purpose not only serums of normal individuals should be employed, but also serums which, from experience, at times give a positive Wassermann reaction. It has already been pointed out that in such cases we may not be dealing with the same biologic process which takes place in the serum of a luetic, but with a non-specific process which simulates the specific reaction in syphilis. Many serums from cases of various general diseases contain substances which inhibit hemolysis. If to such serums antigen is added which also contains bodies capable of binding complement, we are able to observe a summation of these two binding substances which absorb all the complement.

The specificity of the antigen used was determined by the luetin reaction, in so far as this reaction may be called specific. Extract of the gumma gave positive reaction in tertiary cases of this disease.

These comparisons of the antigens of gumma cover only the preliminary stages of the work we have begun. The antigens prepared from the several strains of the spirochetes are more active and for this reason had to be diluted from ten to twenty times more than the ordinary antigens prepared from syphilitic fetal organs or normal tissues. This high dilution of the antigen minimizes the physical influence, which strong alcoholic antigens exert on the serums to be tested. The antigens when admixed with physiologic salt solution were practically clear, differing in this respect from other antigens which in dilution show milky white turbidity. Another difference noticed between the rabbit gumma antigen and other antigens is the more delicate reading of the results of the reaction. The cases of doubtful clinical diagnosis are more clearly brought out by these antigens.

The sensitiveness of these antigens to luetic serums led us to test them against serums from leprosy and scarlet fever. Through the kindness of Dr. Guy L. Kiefer, health officer of Detroit, we were able to obtain serums from scarlet fever patients while the disease was in its eruptive stage and at different periods following this stage. The leprosy serums included were obtained through the courtesy of Dr. James MacFarlane Winfield of Brooklyn, to whom we desire to express our thanks.

The syphilitic lesions in rabbits permitted us to obtain antigens which to a degree are more specific than the antigens generally employed, since these gumma contain the spirochetes in large numbers free from contamination. At the same time we were reasonably certain that our antigens were free from the bile salts which possibly are present in the antigens made from fetal syphilitic livers.

The fact that Schwartz and McNeil were able to improve the fixation of complement in gonorrhea by combining twelve strains of the gonococci of their antigen led us to combine the four strains of the *pallida* for the antigens we employed. By so doing, we increased the efficiency of the antigens. The reaction was negative, however, in the serums of patients having just passed the eruptive stage. The serums of leprosy patients were also positive, yet to a less degree than the luetic controls. How far this reaction is due to the leprosy per se, it was impossible for us to determine.

SUMMARY AND CONCLUSIONS

1. The use of syphilitic gumma in the testis of rabbits yields a more specific antigen than any obtained from other syphilitic or normal tissue.

2. The combination of a number of strains, giving a polyvalent antigen, increased the value of the antigen, permitting the diagnosis of clinically doubtful cases.

3. Aqueous antigens lose their strength in about one month while those prepared with acetone and alcohol are stable.

From our data, we incline to the view that in the Wassermann reaction of syphilis, we may be dealing with three distinct reactions. First, we deal with the antibodies produced against the causative organism—if such antibodies are produced; next, we are dealing with substances, possibly antibodies, directed against bacterial lipoids, and, finally, with a group of substances, autolytic in nature, which the tissues of the body evolve against the toxic substances resulting from the influence of the *Spirochaeta pallida* on the tissues.

Washington Arcade.

ABSTRACT OF DISCUSSION

Dr. Howard Fox, New York: The antigen is the all-important factor in the Wassermann reaction, but the attempts that have thus far been made to standardize our preparations have not been particularly successful. It would be a great step in advance if we could find a standard antigen which every one could use, as in that way there would be fewer divergent results from different laboratories. During the past year I have used the alcoholic extract of normal heart, titrating the complement and using decreasing amounts of the serum of the patient. By this method I have obtained better results than I did formerly with the alcoholic extract of fetal liver.

Dr. J. Frank Waugh, Chicago: There is one other antigen which I do not think has been mentioned. Noguchi has done a great deal of work on the serodiagnosis of syphilis, and in one of his articles on the subject he mentions an insoluble acetone antigen. Dr. Harris gave me some soluble acetone antigen, and on testing it, I found it very efficient. The acetone extract gives a stronger reaction in some cases than the alcoholic extract. In the last year I have tried and compared both the alcoholic and the aqueous extracts with the acetone extract and have found the latter just as efficient. I agree with Dr. Fox regarding the importance of a strong, standard antigen.

In the *Deutsche medizinische Wochenschrift* (Dec. 5, 1912), O. Stiner reported his experiences with the use of acetone extracts. He reports that in some cases of positive lues, in which alcoholic extracts gave negative results, positive reactions are secured with an acetone-liver extract.

Dr. M. L. Heidingsfeld, Cincinnati: I take exception to Dr. Varney's statement that the gonococcus complement-fixation test is more reliable than the Wassermann, in order to spare the Wassermann too much undeserved disrepute. Theoretically, the gonococcus test should be more reliable than the Wassermann, but experience has shown that the Wassermann is far the more reliable of the two. The Wassermann never errs on the unsafe side, and is a reliable procedure if the details are carefully and properly carried out. As Wassermann has pointed out, there is a fundamental reason for every step of the reaction. Some of the modifications may be more delicate, but they are at the same time the less reliable.

Dr. Rudolph Buhman, St. Louis: Did Drs. Varney and Baeslack use a watery or an alcoholic preparation as an antigen?

Dr. H. R. Varney, Detroit: I thoroughly agree with Dr. Fox that what we are searching for is a standard antigen, and that when it is found we shall have more uniform laboratory reports. Regarding the preparation of the antigen, the aqueous, acetone and alcoholic were used and checked up in series.

Regarding my estimate of the comparative accuracy of the Wassermann and the gonococcus fixation tests, which Dr. Heidingsfeld criticized, I would say that, so far as I have been able to follow the laboratory records, I am able to assert that by the fixation test it is possible to pick out the diplococcus of Neisser from a large family of similar organisms, which is proved clinically, while with the Wassermann test we cannot with our present knowledge positively exclude other diseases, as tuberculosis, scarlet fever or leprosy.

Dr. F. W. Baeslack, Detroit: The delicacy of the test depends largely on the titration of the antigen. We may titrate for its delicacy and sensitiveness, and it is only when tested against weak syphilitic cases that a real idea of the value of the antigen is obtained. It is in the careful titration of the antigen that the secret lies, and what we are searching for is a reliable antigen.

Suggestion and Disease.—It is undoubtedly true that a serene spirit is a valuable agency in the recovery from disease. It is likewise true that suggestion has a mighty potency when it is rightly applied. It is a legitimate and recognized branch of therapeutics, which may be destined to have a wide application in the future treatment of disorders of the nervous system. But it is likewise true that suggestion heals no broken bones, a spirit unperturbed gives no safeguard against poisoned mosquitoes, and the power of the will and the imagination is potent chiefly against disorders of the imagination and the will.—David Starr Jordan, *Science.*

CLINICAL OBSERVATIONS ON THE EMETIC ACTION OF DIGITALIS[*]

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Nausea and vomiting are probably the commonest of the side-actions encountered in the clinical use of the digitalis bodies. They have generally been attributed to a local irritant action of these substances on the mucous membrane of the alimentary canal. In two previous papers[1] Dr. Hatcher and I have shown that the digitalis bodies cause nausea and emesis in animals through their direct action on the vomiting center in the medulla. We have been unable to find in the literature, or to adduce from our own experiments, any evidence either to controvert this statement or to support the opposite view of local irritant action in the stomach or intestine. In view of our experimental findings we called attention to the need for a carefully controlled series of observations on the seat of the emetic action of therapeutic doses of this group of drugs when used clinically. It is the purpose of the present paper to set forth the results of such a series of observations, together with a review of several series of cases reported in the literature in other connections, and to correlate the clinical and experimental data as far as possible.

Fifteen cases of cardiac valvular disease were studied in the wards of Bellevue and New York Hospitals.[2] In all but one of the cases the clinical observations were supplemented by the use of the polygraph. None of the patients received other medication which might in any way influence the actions of the digitalis, except Nos. 4 and 6, who received tincture of nux vomica, and Nos. 6, 10 and 13, who were given atropin, with a view to studying the modifying effects of these drugs. A brief summary of each case follows, fibrillating and non-fibrillating cases being considered separately.

In the summaries, and in all of the tables, the expression "clinical improvement" is used for brevity, and by it is meant clinical evidence of definite improvement in those symptoms referable to impaired cardiac action.

Case 4.—B. H., No. D. 2, 417. Woman, aged 65. After taking 1.6 gm. of digitalis in the form of tincture, m. x, q. 4 h., vomiting began. Tracings showed slowing and coupled rhythm. Marked clinical improvement preceded the vomiting. The digitalis was continued together with m. x of tict. nux vomica, but the vomiting continued and both drugs were stopped. After an interval of five days tinct. digitalis was given again, m. xx, q. 4 h., until 0.6 gm. of leaf had been taken when vomiting, slowing of pulse, and coupled rhythm returned.

Tables 1 and 2 present these case records more concisely.

Eleven patients, ranging in age from 15 to 65 years and all suffering from auricular fibrillation, developed either nausea alone, or nausea and vomiting, is a result of taking digitalis. The shortest time from the beginning of digitalis administration to the appearance of nausea or vomiting was about two days, in Case 7 the patient having taken 2 gm. of the leaf in this period. The longest interval was seven days, in Cases 1 and 8, in both of which it will be noticed that the effect of the drug on the heart was relatively less marked than the average. The average time elapsing from the beginning of digitalis treatment to the onset of nausea or vomiting was five days. The smallest dose causing nausea or vomiting in the first course of treatment was 1.6 gm., the largest 6.25 gm., and the average for the eleven cases was 3.08 gm., corresponding to about 7¾ drams of the tincture.

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[*] To save space this paper has been abridged by the omission of case reports, except one typical case (Case 4), and the illustrations. The complete paper will appear in the Transactions of the Section and in the author's reprints.

[*] From the Laboratory of Pharmacology, Cornell University Medical College.

[*] Read in the Section on Pharmacology and Therapeutics of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

[1] Eggleston, Cary, and Hatcher, R. A.: The Emetic Action of the Digitalis Bodies, Jour. Pharm. and Exper. Therap., November, 1912; The Emetic Action of the Digitalis Bodies, The Journal A. M. A., Feb. 15, 1913, p. 499.

[2] I have to thank the several visiting physicians, Drs. William Gilman Thompson, Warren Coleman, F. S. Meara, Lewis A. Conner, and William R. Williams for the privilege of making these observations.

Five of the patients received a second course of digitalis from which nausea or vomiting also resulted, and in each case the total quantity of digitalis required to cause these symptoms was less in the second course than in the first. Except in Case 3, in which there was an interval of sixty days between courses, and possibly also in Case 2, in which the interval was twenty-four days, the smaller second course is attributable to the persistence of action of the drug from the former course.

Some of the patients had complained of nausea and vomiting when admitted to the hospital, and one or two vomited a few times within the first few hours, but in no case did these symptoms persist after the first twenty-four hours of treatment with digitalis, which in itself is evidence of an improvement in the heart action with a diminution of congestion resulting from absorption of the drug. Such an observation shows, further, that the digitalis given did not cause vomiting by irritation of the gastric mucosa, even in these cases in which this was rendered abnormally irritable through congestion.

TABLE 1.—CASES OF AURICULAR FIBRILLATION

Case	Digitalis	Am't. Dig. at N. or V. in gm. of leaf	Pulse at beginning of Digitalis	Nausea or Vomiting	Pulse at Time of N. or V.	Effects of Digitalis at Time of N. or V. with Reference to Action on Heart
1.	Inf. oz. ½ q. 4. h.	6.25	88	V.	70	Slowing; c-r;* cl. imp.* See Note 1 below
	Inf. oz. ½ q. 4. h.	1.60	78, 84, 56, 88	V.	56, 44, 56, 44	Slowing; c-r; cl. imp. See Note 2 below
2	Inf. oz. ½ q. 4. h.	3.29	100	V.	48	Slowing; c-r; cl. imp.
	Inf. oz. ½ q. 4. h.	2.40	64—80	V.	44- 56	Slowing; cl. imp.
3	Tr. m. xx q. 4. h.	2.20+	180	V.	80	Slowing; cl. imp See Note 3 below
	Tr. m. x t. i. d.	1.50	105	V.	88	Slowing; c-r; cl. imp.
4	Tr m. x q. 4. h	1.60	140	V.	84	Slowing; c-r; cl. imp. See Note 4 below
	Tr. m. xx q. 4 h.	0.60	84	V.	68	Slowing; c-r
5	Tr. m. xxv q. 4. h.	3.66	80+	N.	56	Slowing; c-r; cl. imp.
6	Tr. m. xv q. 4. h.	2.30	84	V.	60—	Slowing; cl. imp.
	Tr. m. xx q. 4. h.	2.12	48	V.	42	Slowing; c-r See Notes 4 and 5 below
7	Tr. m. xx q. 4. h.	2.00	78+	N.	40	Slowing; c-r; cl. imp.
8	Tr. m. xv q. 4. h.	2.60	160	V.	44	Slowing; cl. imp. See Note 6 below
9	Tr. m. xx q. 4. h	1.86	88+	V.	76	Slowing; cl. imp.
10	Tr. m. xxx q. 6. h.	3.80+	84—100	V.	27—38	Slowing; cl. imp. See Notes 5 and 7 below
11	Tr. m. xxx q. 4. h	4.36	88— 94	V.	64—90	Slowing; c-r; cl. imp. vent. ext. sys.

1. The dose was reduced to dr. 2 after four days.
2. The single occurrence of a rate of 56 in the first series is probably attributable to the fact that the pulse was irregular and weak, and that not all beats were felt.
3. Three minims of fluidextract of digitalis preceded the administration of the tincture.
4. In Case 4 after the first vomiting the digitalis was continued in the same doses, but with the addition of tr. nux. vomica m. x. to each dose. This, however, had no effect on the vomiting, so both drugs were then stopped. In Case 6 the second course of digitalis was given along with m. x of tr. nux. vom., which, however, did not prevent the return of the vomiting.
5. In Case 6 atropin sulphate 3/100 grain subcutaneously caused the disappearance of the coupled rhythm and accelerated the pulse from 42 to 70 per minute. In Case 10, 3/100 grain of atropin sulphate subcutaneously caused very little increase in the pulse-rate—a rise from 27 per minute to 46 per minute.
6. Infusion of digitalis (1½ oz.) was given prior to the use of the tincture
7. As the patient was in a serious condition strophanthin 0.5 mg. was given before the use of digitalis was started.

* c-r.=coupled rhythm; cl. imp.=clinical improvement.

TABLE 2.—CASES OF CHRONIC CARDIAC VALVULAR DISEASE WITH REGULAR RHYTHM

Case	Digitalis	Am't Dig. at N. or V. Gm. of Leaf	Pulse at beginning of Digitalis	Nausea or Vomiting	Pulse at Time of N. or V.	Other Effects of Digitalis at Time of N. or V. with Reference to Action of Drug on Heart.
12	If. oz. ½ q. 4 h.	2.60	92—120	V.	88—96	Sinus arhythmia. Clin. imp.
	If. dr. 2 q. 4 h.	1.92	80—100	V.	88—90	No tracing; notes incomplete.
13	T.m. x t. i. d.	2.00	68	N.	58	Recurrent h-b. Clin. imp. See Note 1 below.
	T.m. xx q. 4 h.	0.60	64	V.	48	Recurrent h-b.
14	T.m. xv q. 4 h.	2.30	88	V.	75	Clinical improvement. See Note 2 below.
15	T.m. xv q. 4 h.	2.66	72—92	V.	60—72	Clinical improvement. See Note 2 below.

1. In both instances the administration of atropin removed the heart-block, but in neither did it cause more than a trifling acceleration of the pulse.
2. In Case 14 the course of tr. dig. was broken by 5 doses of ½ oz. each of infusion. In Case 15 the tincture was given for 8 doses, being then followed by the infusion in ½ oz. doses q. 4 h. for 8 doses.

Tincture of nux vomica has been said to prevent the vomiting resulting from digitalis if given along with it, but this was not the case with Patients 4 and 6 in this series.

In the four cases with regular rhythm, the signs of the action of the drug on the heart at the time of the nausea or vomiting were none the less definite, though, in general, they were not so striking as in the case of those patients whose hearts were in a state of fibrillation. This is in accordance with the almost universal observation that the rate and rhythm of the heart under the control of the normal pace-maker is less easily and less markedly affected than is the case when the normal pace-maker is not in control.

The average emetic dose in this series was 2.4 gm. (first course). The average time from the beginning of treatment to the appearance of nausea or emesis was seven days as compared with five in the previous series, the difference being due in great measure to the fact that less digitalis was given per day than in the first series. Cases 12 and 13 show "cumulation" of the drug, as regards both emetic and cardiac actions.

In none of these fifteen cases did the nausea or vomiting bear any constant time relation to the administration of the dose of digitalis, and in most cases nausea or vomiting persisted or recurred for some hours after the last dose had been given and the drug withdrawn.

To supplement my personal observations I have collected all of the cases reported in *Heart* from its first number to, and including, the latest issue at the time of writing (Volume IV, No. 2) in which sufficiently detailed accounts are available for me to determine the relation of the nausea or vomiting to the effect of the drug on the heart. A few of the cases reported by Cushny, Marris and Silberberg are omitted, being taken instead from the more detailed account given by Silberberg in his paper. No reported case which showed either nausea or vomiting has been omitted if the details given were at all adequate to the requirements. The cases, therefore, are not selected, except in so far as sufficiency of reported detail is concerned. These cases are given in Tables 3, 4 and 5, together with an indication of their exact source for reference.[4]

From Table 3 and notes, it is obvious that in every instance the development of nausea or vomiting was associated with definite evidence of the absorption of the digitalis and its action on the heart. The average amount (first course) causing these phenomena was 3.66 gm. of leaf (minimum 1.5 gm., maximum 8.5 gm.). As in my personal observations, the interval before the onset of nausea or emesis was several days, always more than two.

In Table 4 five instances of nausea or vomiting are recorded in which there was no certain evidence of the action of the drug on the heart. Four others (Cases 40 to 43) which were not "cardiac" cases also failed to show definite evidence of digitalis action on the heart when nausea or vomiting developed. It is remarkable that of so many patients with the normal heart-rhythm such a large proportion should have shown definite signs of the cardiac action of digitalis, when given in therapeutic doses. In this series the average amount taken before nausea or vomiting was caused was 3.34 gm. of leaf, and the interval was never less than two days.

TABLE 3.—CASES OF AURICULAR FIBRILLATION—FROM LITERATURE

Case	Tincture Digitalis	Am't. Dig. at N. or V. Gm. of Leaf	Nausea or Vomiting	Effects of Digitalis at Time of N. or V., with Reference to Action on Heart
M. 1	m. xv q. 4 h.	2.5	N.	Slowing
	m. xv q. 4 h.	4.0	N.	Slowing
	m. xv q. 4 h.	5.0	V.	Slowing
M. 2	m. xxx t. i. d.	3.5	V.	Slowing
M. 3	m. xxx t. i. d.	1.5	V.	Slowing
	dr. i. daily	2.25	V.	Slowing; coupled rhythm
M. 5	m. xv q. 4 h.	1.5	V.	Slowing *
	m. x t. i. d.	1.25	V.	Slowing; coupled rhythm
M. 6	m. xx q. 4 h.	2.6	N.	Slowing
M. 7	m. xv q. 4 h.	3.25	V.	Slowing; clinical improvement
M. 8	m. xv q. 4 h.	3.25	V.	Slowing
M. 9	m. xv t. i. d.	1.87	N.	Slowing †
	m. xv q. 4 h.	2.00	V.	Slowing
M. 10	m. xv q. 4 h.	1.50	V.	Slowing; clinical improvement
M. 13	m. xv q. 4 h.	6.00	N.	Slowing; clinical improvement
M. 14	m. xx t. i. d.	2.50	V.	Slowing; clinical improvement
M. 15	m. xx t. i. d.	3.50	N.	Slowing;‡ clinical improvement
M. 16	m. x q. 4 h.	2.50	V.	Slowing; clinical improvement
A. 3	m. xv q. 4 h.	3.00	V.	Slowing; clinical improvement
C. M. S. 12	m. xx t. i. d.	8.50	V.	Slowing; coupled rhythm
C. M. S. 13	m. xx t. i. d.	3.00	N.	Slowing §
C. M. S. 14	m. xx t. i. d.	6.00	N.	Slowing ¶
C. M. S. 15	m. xx t. i. d.	8.37	V.	Slowing; coupled rhythm
S. 1		2.50	N.	Slowing
S. 3		3.50	N.	Slowing
S. 5		1.75	V.	Slowing
S. 6	m. xx t. i. d.	4.25	N.	Slowing
S. 7		7.59	V.	Slowing

* The first vomiting came on before noticeable slowing of the heart, but a note on the next day records clinical improvement, and slowing *soon appeared. In the second course the slowing was synchronous with the vomiting. A third course gave results exactly* similar to the second—slowing and coupled rhythm together with vomiting.

† Two additional courses of digitalis caused nausea in one and vomiting in the other, together with slowing.

‡ The slowing was not marked and lasted for one day only, but the clinical improvement was very definite.

§ Continuation of the digitalis caused a recurrence of nausea and the pulse slowed still further.

¶ Tincture of strophanthus was subsequently given to this patient (dose and interval not stated) and caused vomiting together with marked slowing of the pulse-rate.

DISCUSSION

Pharmacologic studies[1] show that in therapeutic doses the digitalis bodies produce nausea and vomiting by their direct action on the vomiting center in the medulla, and probably in no other way, for:

1. All true digitalis bodies are more actively emetic when administered intravenously than when given by mouth.

2. When emesis follows the oral administration of these bodies to cats it can be shown that emetic doses have been absorbed, and, on the other hand, when emesis does not result from the oral administration of many times the fatal vein dose, it can be shown that absorption has not taken place.

3. The phenomena characteristic of emesis follow the intravenous administration of the digitalis bodies to dogs after the removal of the gastro-intestinal tract.

As a result of these observations, and in the absence of any contrary evidence, we expressed the opinion that the emesis and nausea resulting from the clinical use of these drugs were due to their action on the vomiting center after absorption.

As evidence of the absorption of digitalis in man I chose its action on the heart. It was obvious that no two patients would respond with precisely similar indications of the cardiac action of the drug and, therefore, one or more of the following responses was believed to afford sufficient evidence of the action of the drug on the heart: (*a*) slowing of the pulse-rate definitely dependent on the use of the drug; (*b*) traceable alterations in the heart rhythm, such as heart-block (partial or complete), coupled rhythm, auricular fibrillation, ventricular extrasystoles, sinus arhythmia, or combinations of these; (*c*) clinical improvement, as indicated by diminution in, or disappearance of, cyanosis, dyspnea, orthopnea, venous congestion; decrease in the size of area of cardiac dulness; diuresis. It has been my practice throughout the analysis of the cases not to accept less than two of the phenomena in the third group as sufficient evidence of the action of the drug on the heart, and, therefore, of absorption of an effective quantity.

A further point in evidence of absorption, but one less constantly encountered through the circumstances of the case, is the presence of "cumulation" as shown by the need of a smaller amount of the drug in a second course of treatment to bring about an action on the heart.

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[4] In the tables the initials refer to the names of the authors as follows: M.—Mackenzie: Heart, 1910-1911, ii, 273. W.—Windle: Heart, 1911-1912, iii, 1. A.—Agassiz: Heart, 1911-1912, iii, 353. L.—Lewis: Heart, 1912-1913, iv, 171. C., M., S.—Cushny, Marris and Silberberg: Heart, 1912-1913, iv, 33. S.—Silberberg: Tr. Roy. Soc. Med., 1911, Pharm. and Therap. Sect., p. 192.

In Tables 1 to 5, and the accompanying notes, I have collected and recorded 110 courses of treatment with one or other of the digitalis bodies resulting in nausea or vomiting.

All of the observations were most carefully made and I have subjected the cases taken from the literature to the same rigorous conditions of analysis as held for my own. The observations were made by no less than seven different men other than myself. They are summarized in Table 6.

Of 106 courses of digitalis treatment in cardiac disease resulting in the appearance of nausea or vomiting, 100, or 94.3 per cent., showed indisputable evidence of absorption of the drug prior to the onset of these symptoms. In fifty-five observations on cases with auricular fibrillation, nausea or vomiting was associated with the absorption of the drug in every instance. In fifty-one observations on cardiac cases with the normal rhythm, indisputable evidence of the absorption of the drug was available in forty-five instances, or 89.6 per cent. In four noncardiac cases there was no evidence of the action of digitalis on the heart, but it must be mentioned that each of these patients took an amount of the drug equivalent, at least, to the minimum taken by the others who did show evidence of action on the heart, before nausea or vomiting was induced. This is also true of the six instances in cardiac cases in which there was either no evidence, or in which this was insufficient, for the positive statement that absorption had occurred. It is therefore quite evident that one would be justified in concluding that even in these instances absorption had taken place before the nausea or vomiting developed. If this is granted, there is, then, but a single instance in the entire series of 110 observations in which there is any doubt that the nausea and vomiting resulted only after the absorption of a sufficient amount of the drug. This one possible exception is referred to in the second footnote under Table 4, and in view of the facts just brought forth it seems unlikely that this was due to local action of the digitalis on the alimentary mucosa.

These observations not only yield overwhelming evidence to show that nausea and emesis resulting from the clinical use of the digitalis bodies are dependent on the absorption of a sufficient amount of the drug, and, therefore, as in animals, on its central action, but they afford equally unequivocal evidence against the belief in the local irritant action of these bodies. The drug was given by mouth in amounts varying from 0.25 mg. (1/250 grain) of crystalline digitoxin (Nativelle's digitalin granules) up to 0.21 gm. (3⅓ grains) of digitalis in the form of infusion, and 0.24 gm. (3¾ grains) in the form of tincture (British Pharmacopeia) at a single dose without causing any nausea or gastric symptoms whatever in the entire series, with but a single exception, prior to absorption of a sufficient amount to cause cardiac effects, although the dose was repeated at intervals ranging from once in six to once in four hours. I have in addition given several single doses of a dram of the tincture (6 grains or 0.36 gm. of leaf) of digitalis to different patients and have never seen nausea or vomiting result

TABLE 4.—NON-FIBRILLATING CASES—FROM LITERATURE

Case	Heart Lesion	Tincture Digitalis	Am't. Dig. at N. or V. Gm. of Leaf	Nausea or Vomiting	Effects of Digitalis at Time of N. or V. with Reference to Action on Heart
M. 17	Mit. sten.	m. xx t. i. d.	2.50	V.	"Felt better" *
	Mit. sten.	m. xx t. i. d.	3.50	V.	Auric. fib., slowing
M. 18	Mit. sten.	m. xx t. i. d.	3.00	V.	Slowing, heart-block
M. 19	Mit. sten.	m. xv t. i. d.	2.50	V.	Slowing †
M. 20	Mit. sten.	m. xv q. 4 h.	2.50	V.	Slowing, extra-syst. ‡
M. 21	Mit. sten.	m. xv q. 4 h.	2.75	V.	Heart-block §
M. 23	Mit. sten.	m. xv t. i. d.	2.25	V.	None on heart, etc. ¶
M. 24	Mit. sten.	m. xv q. 4 h.	5.87	V.	Slowing, heart-block, etc.
M. 25	Mit. sten.	m. xv t. i. d.	2.75	V.	Slowing, sinus arhyth. ‖
M. 27	Mit. & aor. dis.	m. xx t. i. d.	6.50+	V.	Slowing, heart-block
			4.50	V.	Slowing, heart-block, etc.
M. 28	Aort. dis.	m. xx t. i. d.	3.50	V.	Clinical improv.
M. 29	A. & M. dis.	m. xv q. 4 h.	2.50	V.	"Felt better"
		m. xv t. i. d.	2.25	V.	"Felt better" **
M. 30	Aort. dis.		2.37	V.	None evident
M. 31	A. & M. dis.	m. xv q. 4. h.	4.12	N.	Clinical improv. slowing? ††
M. 32	A. & M. dis.		2.00	V.	None evident
M. 33	A. & M. dis.	m. xv q. 4. h.	2.25	V.	Clinical improv.
M. 34	A. & M. dis.	m. xv q. 4. h.	2.12	V.	Clinical improv.
M. 35	A. & M. dis.	m. xv t. i. d.	3.50	V.	None evident
M. 36	A. & M. dis.	m. x t. i. d.	3.00	N.	Vent. ext.-syst.
M. 37	Paroxys. tach.	m. xx t. i. d.	2.00	N.	Slowing, aur. fibril.
M. 38	Tachycardia	m. xx t. i. d.	4.00	N.	Aur. fibril. ‡‡
M. 40	Emphysema	m. xv q. 4. h.	3.00	V.	None evident
M. 41	Tuberculosis	dr. i. q. d.	1.50	V.	None evident
M. 42	Tuberculosis	dr. i. q. d.	2.50	N.	None evident
M. 43	Tuberculosis	m. xx t. i. d.	2.00	N.	None evident
W.	Mit. dis.	m. xv t. i. d.	5.25	V.	Heart-block
C. M. S. 2	sl. sinus irreg.			N.	Incr. sinus irreg., slowing
S. 3	sl. sinus irreg.	m. xx t. i. d.	3.00	V.	Bigem. pulse, aur. ext.—synst.
S. 4	A. & M. insuf.	m. xx t. i. d.	5.00	N.	Heart-block. ?
			6.50	N.	Heart-block.
S. 8	A. & M. dis.		7.50	V.	Heart-block.
S. 9	A. & M. dis.		5.00	N.	Heart-block.
S. 10	Mit. sten.		?	V.	Slowing
L. 2	Auric. flutter	m. xxx — c. q. d.	4.00	V.	Heart-block, aur. fibril.
L. 4	Auric. flutter	m. xxx — ix q. d.	2.50	V.	Heart-block

* The notes state that the patient felt better, but that there was not much improvement, and the table shows no slowing of the pulse. The second course of digitalis was followed by vomiting associated with indisputable evidence of digitalis action on the heart.

† This patient vomited on the second day, after 0.75 gm. of digitalis, but there is no note to guide me in forming a correct opinion of the cause of this vomiting; it is possible that it was due to the digitalis, but it is just as likely to have been the result of some other cause, such as the venous congestion so often present in cases of deficient heart action. In two other courses of digitalis (in addition to the one in the table) there was vomiting, and in one of these slowing was marked.

‡ The detailed record shows the pulse to have slowed from 72 to 80 to 57 to 60, though the notes state that there was no appreciable effect on the heart-rate.

§ The heart-block appeared in tracings taken on the day after the vomiting and cessation of digitalis.

¶ The notes state that the respiration had become easier.

‖ These phenomena were repeated after another course of digitalis (3 gm.).

** The notes state that after the first course the patient felt better than on any day since she had been in the hospital.

†† On the date of vomiting, "A pulse rate of 54 and one of 100 was noted . . . ."

‡‡ A second course (1 gm.) caused nausea but no effect on the heart rate.

directly from such large doses.[5] These observations controvert the statements that the digitalis bodies are irritant to the gastro-intestinal mucosa in therapeutic amounts. This agrees precisely with the experimental observations made by Dr. Hatcher and myself on this point. We also found that even the commonly incriminated fixed oil of digitalis, and digitonin, did not irritate the stomach or cause vomiting, except when the latter was given in enormous quantities, such as would be utterly impossible in the use of even the most impure galenical.

CONCLUSIONS

1. There is neither valid experimental nor clinical evidence that therapeutic doses of the digitalis bodies cause nausea or vomiting through local irritant action on the alimentary tract.

2. There is very strong evidence, both experimental and clinical, for the statement that the digitalis bodies do not cause vomiting or nausea by local irritation of the alimentary tract.

3. There is experimental evidence that the nausea and vomiting resulting from therapeutic quantities of these bodies are due solely to their direct action on the vomiting center and therefore result only after the absorption of a sufficient amount of the drug.

4. The clinical evidence brought forth in this paper is in agreement with all preceding experimental evidence to the effect that nausea and vomiting from therapeutic quantities of the digitalis bodies result from their absorption, and not from their local action.

5. The conclusion that the nausea and vomiting resulting from the therapeutic use of these bodies in man are due to their direct action on the vomiting center is a logical necessity.

I do not wish to imply that, in certain rare instances in patients whose reflex vomiting mechanisms are hypersusceptible, the administration of a dose or so of digitalis might not cause vomiting quite without the participation of any direct central action. We all know that a sip of milk or a drink of water is capable of provoking vomiting in some hypersensitive people. I do believe, however, that the emetic action of the digitalis bodies in man is central in practically all cases, and I believe that carefully conducted clinical observations will fully substantiate this statement.

DEDUCTION

From these conclusions I wish to make one deduction: Inasmuch as it has been shown that all true digitalis bodies produce nausea and vomiting by direct central action, it is fallacious and wholly irrational to seek to avoid these symptoms resulting from the oral administration of any given preparation by resort to another preparation or to another channel of administration. Such means have been resorted to frequently and often with a disappearance of the nausea or vomiting. When this has been the case the new preparation has been either weaker or less well absorbed, or the new channel has been one from which absorption has been less complete. Such observations do not in any way contradict the conclusions of this paper, but rather support them.

414 East Twenty-Sixth Street.

TABLE 5.—PATIENTS RECEIVING DIGITALIS BODIES OTHER THAN THE LEAF

Case	Heart Lesion	Digitalis Body	Am't. at Time of N. or V. mg.	Nausea or Vomiting	Effects of Drug at Time of N. or V., with Reference to Action on the Heart
L. 3	Auric. flutter	Nativ. Digitalin	9.0	N.	Slowing, heart-block
M. 11	Auric. fibril.	Nativ. Digitalin	2.25	N.	Slowing
M. 38	Tachycardia	Nativ. Digitalin	8.25	N.	Slowing
M. 39	Heart-block	Nativ. Digitalin	3.75	N.	Clinical improv. *
			gm.		
M. 7	Auric. fibril.	Tr. Str. m. xxx t. i. d.	0.6	V.	Slowing, clin. improv.
M. 9	Auric. fibril.	Tr. Str. dr. i. q. d.	0.2	V.	Slowing
M. 10	Auric. fibril.	Tr. Str. m. xv q. 4. h.	1.0	N.	Slowing
M. 13	Auric. fibril.	Tr. Str. m. xxx q. 4. h.	1.9	V.	Slowing
M. 19	Mit. sten., reg.	Tr. Str. m. xv q. 4. h.	0.7	N.	Slowing
M. 25	Mit. sten., reg.	Tr. Str. m. xv q. 4. h.	1.6	N.	Slowing
W.	Mit. disease reg.	Tr. Str. m. xv q. 4. h.	0.9	N.	Slowing, heart-block
			1.2	V.	Slowing, heart-block
C. M. S. 15	Aur. fibril.	Tr. Str. m. xx t. i. d.	0.3+	V.	Slowing, bigeminus
M. 9	Aur. fibril.	Tr. Scillae		R.	Slowing, clin. improv. †
W.	Mit. disease	Tr. Scillae m. xxx t. i. d.		N.	Heart-block
W.	Mit. disease	Ext. Apocynum		V.	Slowing

* In this case the heart-rate before the digitalis was given was only 30 per minute, and hence no slowing was to be expected as a result of treatment.

† The record states that there was marked retching (R) but no vomiting.

TABLE 6.—SUMMARY OF ALL OBSERVATIONS

Classification	Number of Instances Showing N. or V.	Number in Which There Was Positive Evidence of Action of Digitalis on Heart	Per cent. Showing Action on Heart
Auricular fibrillation	55	55	100
Cardiac disease with regular rhythm	51	45	89.6
Non-cardiac	4	0	0
Cardiac (total)	106	100	94.3
Total	110	100	90.9

ABSTRACT OF DISCUSSION

Dr. Clyde Brooks, Pittsburgh, Pa.: Dr. Schleiter and I carried out some experiments on the effect of digitalis on the blood-pressure of the unanesthetized animal. We incidentally observed that tincture of digitalis administered intravenously did cause vomiting. We agree with Eggleston and Hatcher that the emesis is a result of the action of the drug on the central vomiting mechanism.

Dr. Robert A. Hatcher, New York: The testimony of various clinical observers concerning strophanthus supports our own contentions regarding this drug. Fraser, in 1885, found that strophanthus caused fewer gastro-intestinal disturbances than digitalis, a fact which is explained, in part, by my own observations that strophanthus is not absorbed so readily as digitalis from the gastro-intestinal tract, but that strophanthus is actually less actively emetic than digitalis in proportion to the cardiac activity. Curiously, true digitalin, which has been supposed to be the least actively emetic, is in fact the most actively emetic of all of the digitalis bodies in proportion to its cardiac activity, the explanation of its seemingly slight emetic activity being that it has been used in extremely small doses.

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[5] Since the reading of this paper I have given as much as 2 drams of the tincture (12 grains of leaf) at a single dose without causing either nausea or vomiting.

PHYSIOLOGY OF THE PYLORUS, PILLEUS VENTRICULI AND DUODENUM AS OBSERVED ROENTGENOGRAPHICALLY *

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NEW YORK

Until 1892 the commonly accepted theory of gastric evacuation had been that offered by Richet and Rossbach, that the stomach contents were first thoroughly mixed with the gastric juices and, after three or four hours, passed rapidly into the duodenum. This conception was discredited by the results of independent investigations on dogs by Hirsch (1892) and Mering (1893), who substituted for it the theory of a rhythmically opening and closing pylorus, through which evacuation began immediately after ingestion. In 1898 Canno announced the discovery of a progressive peristalsis in the cat, and eleven years later Kaestle, Rieder and Rosenthal demonstrated a corresponding phenomenon in the human being.

My conception of the gastric motor phenomenon has been previously described,[1] and will therefore be referred to only in brief. Like the heart-action, gastric action takes place in cycles, marked by a systole and diastole or an alternating contraction and relaxation of all of the peristaltic waves (Figs. 1 to 4). A cycle exists during the time occupied by the formation and duration of each terminal wave. Accordingly the number of cycles required for the progress of an individual peristaltic contraction from its origin near the fundus to its termination at the pyloric sphincter is determined by the number of waves simultaneously exhibited in the stomach. The motor phenomenon is therefore said to be of the one, two, three (Figs. 1 to 4), four, five or six cycle type.

The important rôle played by the small intestine in gastric evacuation was recognized by physiologists thirty years ago; but the peculiar function and diagnostic significance of that region known as the first portion of the duodenum has not been fully comprehended heretofore. It has none of the characteristics of the descending and horizontal duodenum. On the contrary it corresponds so entirely in contour with the pars pylorica and has so many characteristics of the stomach that roentgenographically one is compelled to consider it a continuation of the stomach itself (Figs. 5 to 8). These points were fully described by me[2] in an article in which the term "pyloric cap" was first applied to the first portion of the duodenum. The word cap is more popular than scientific, however, and therefore, with the aid of Dr. Tower of the New York Museum of Natural History, I selected the latin term "pilleus ventriculi," or cap of the stomach.

Considering the active interest now being evinced in duodenal ulcer, as indicated by the recent communications of Moynihan, Codman, the Mayo brothers, Schwartz and Strauss, it may be appropriate more fully to state my reasons for referring to this region as gastric rather than duodenal. Embryologically it has long been recognized that the upper portion of the duodenum is stomach rather than intestine. Mayo[3] calls attention to the fact that "in the early state of fetal existence the duodenum above the common duct is part of the pyloric end of the stomach. Coming from the primitive foregut, it is associated with the stomach in its physiology and pathology, and it is not part of the small intestine, which comes from the midgut."

Anatomically the first portion of the duodenum differs materially from the descending or horizontal portions. Dwight[4] observes that "the first or ascending portion of the duodenum has a strikingly different appearance from the second and third portions, which present numerous, small, irregular folds, particularly on the posterior aspect."

Schwarz[5] calls attention to the dilatation of the pars superior duodeni as observed roentgenographically, and from anatomic and histologic studies notes the resemblance between it and the stomach. 1. The pars horizontalis superior has a smooth inner wall, presenting the delicate, striped longitudinal folds of the stomach lining. The ring-like folds characteristic of the upper part of the jejunum are not present, but appear first in the upper portion of the descending duodenum. 2. Together with the stomach it is attached to the liver by the gastroduodenal hepatic ligament. 3. Histologically it resembles the pars pylorica in that the pepsin glands of Brunner are found here in abundance.

Physiologically the contents of the cap are acid, like the chyme in the stomach.

Surgically 95 per cent. of the ulcers which occur beyond the pylorus are found in the first 1½ inches of the intestine, namely, the cap. They should therefore be described as postpyloric rather than as duodenal ulcers.

The first roentgenograms presenting the cap were exhibited by Henry Hulst in 1906 to illustrate his presidential address before the American Roentgen Ray Society.[6] Its roentgen shadow, however, so closely resembles the pars pylorica that Hulst interpreted this postpyloric region as the pyloric antrum. The dimensions of the cap, like those of the stomach, depend partly on its distention during different stages of digestion, different phases of the cycle and different stages of duodenal peristalsis (compare Figs. 1 and 2 with Figs. 3 and 4). The posture of the body also influences its size, shape and position. The roentgenographic appearance of the cap is of inestimable value in the recognition of gastroduodenal lesions. Variations resembling pathologic deformities are often seen in some of the plates of each series, but these can be readily recognized and definitely differentiated from organic changes. The small indentation frequently observed on either the right or left side of the cap may be due to pressure from the descending portion of the duodenum, the common bile-duct, or the vena porta (Fig. 6). Spasmodic contraction of the cap (Fig. 9) is often the result of iliac stasis, a Lane's kink, or a diseased appendix. Incomplete filling of the cap may be caused by overactive duodenal peristalsis (Figs. 10 and 11). This is more likely to occur in the early stage of digestion, when the pyloric sphincter is strongly contracted, than in the later stages when the sphincter is relaxed and the gastric peristalsis more efficient, even though less active (compare Figs. 12 and 13, and Figs. 15 and 16).

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* Because of lack of space this article is abbreviated in The Journal. The complete article appears in the Transactions of the Section and in the author's reprints.

* Read in the Section on Pathology and Physiology of the American Medical Association, at the Sixty-Fourth Annual Session held at Minneapolis, June, 1913.

[1] Cole, Lewis Gregory: Arch. Roentg. Ray, December, 1911, No. 137, p. 242; The Value of Serial Radiography in Gastro-Intestinal Diagnosis, The Journal A. M. A., Nov. 30, 1912, p. 1947.

[2] Cole, Lewis Gregory: Arch. Roentgen Ray, April, 1912.

[3] Mayo, W. J.: Ulcer of the Duodenum, with a Report of Two Hundred and Seventy-Two Operations, The Journal A. M. A., Aug. 15, 1908, p. 556.

[4] Dwight: Jour. of Anat. and Physiol.

[5] Schwarz: Berl. klin. Wchnschr., 1908, No. 24.

[6] Hulst, Henry: Am. Quart. Roentgenol, January, 1907, p. 9. Case 4.

The function of the cap is that of a reservoir. It receives the acid chyme propelled through the pylorus during the systole of each cycle (Figs. 1, 2 and 8). During the early stage of digestion the chyme is rapidly withdrawn from the reservoir cap by a rather broad periodic peristaltic contraction (Figs. 7 and 10), which propels it through the duodenum, possibly caused by the alternating alkaline and acid reactions in this portion of the intestine. As digestion progresses the cap is more completely filled with the acid chyme, and, considering the presence of Brunner's glands, it is probable that the finishing touches of gastric digestion are received here by the small portion of chyme thus isolated from the bulk of food in the stomach.

The cap is separated from the pars pylorica by a space varying from ⅛ to ¼ inch, indicating the pyloric sphincter (Fig. 8). The importance of its roentgenographic appearance is second only to that of the cap in the diagnosis of lesions in this region. Both its gastric and duodenal surfaces should be smooth and clear-cut, and the lumen should be centrally located. The amount of contraction of the pyloric sphincter is clearly defined roentgenographically. As a rule, it is in proportion to the activity of the gastric peristalsis, that is, when the gastric peristalsis is feeble the contraction of the sphincter is weak (Fig. 13), and when the gastric peristalsis is strong, the sphincter is more tightly contracted (Fig. 12). Alteration in the balance between the contraction of the sphincter and the tone of the stomach is one of the functional disturbances of the pylorus which can be recognized roentgenographically. It causes either a retention of food or an unusually rapid evacuation of the stomach with dilatation of the cap, and sometimes dilatation of the duodenum and jejunum (Fig. 14). In the earlier stages of digestion, when the gastric peristalsis is active, the muscle of the pyloric sphincter contracts

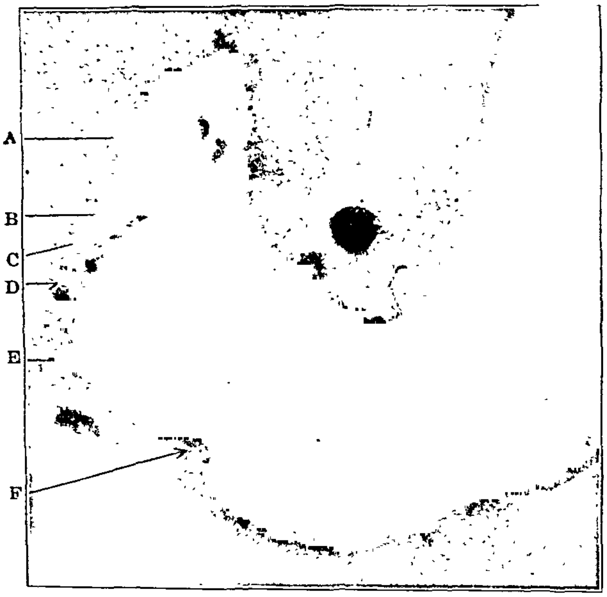

Figure 1.

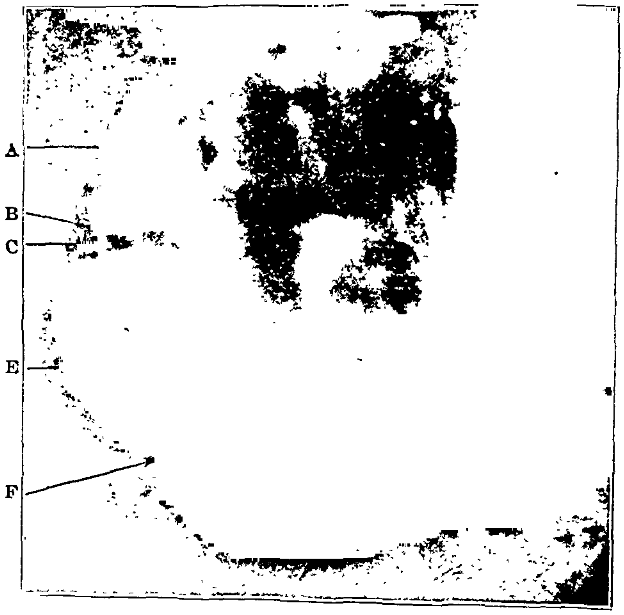

Figure 2.

TWO PHASES OF STAGE OF SYSTOLE

A, cap; *B*, lumen; *C*, pyloric sphincter; *D*, descending duodenum; *E*. terminal wave; *F*, peristaltic contraction.

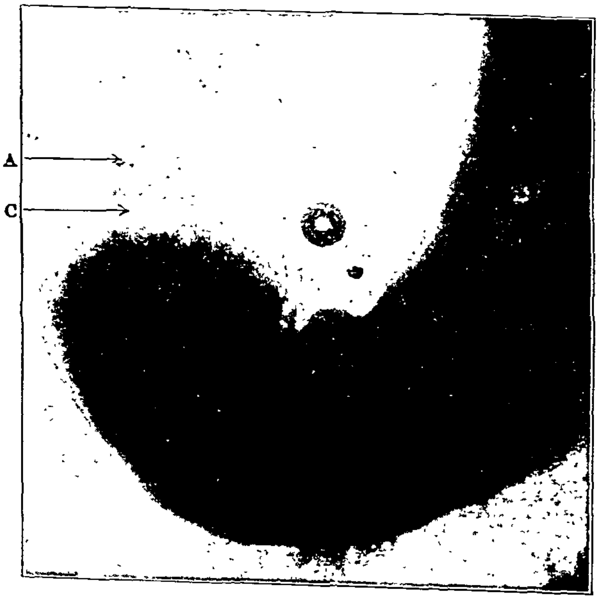

Figure 3.

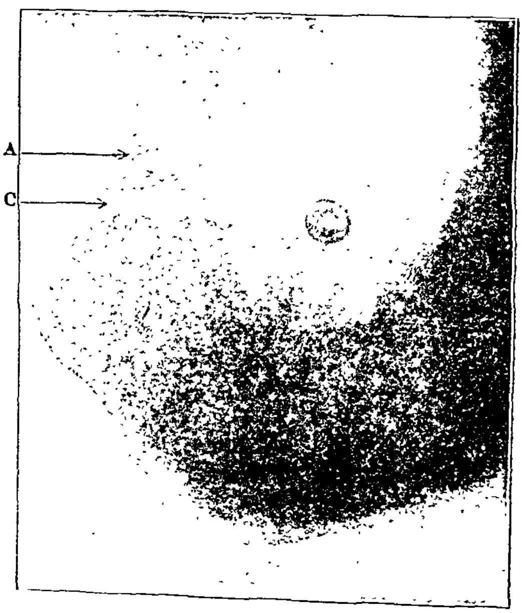

Figure 4.

Two phases of stage of diastole (same case as above). Note relaxation of peristaltic contractions.

therefore, duodenal receptivity controls the evacuation of the cap through duodenal peristalsis rather than the evacuation of the stomach through a pyloric reflex.

Whether the rapid withdrawal of chyme from the cap during the early stage of digestion (Figs. 12 and 15) results from its slight acidity or its fluidity or is demanded by the hungry intestine below is beyond my sphere to determine. Here is a fertile field for physiologic research. Personally I believe that the hungry intestine is an important factor, because, when the food reaches the ileum, the activity of the duodenal peristalsis is much diminished and consequently the cap retains more and the jejunum receives less than during the early stage of digestion.

The motor phenomena of the pylorus, pilleus ventriculi and duodenum herein described as observed roentgenographically, may be demonstrated in all human stomachs having a moderately active peristalsis. Whether or not the same is true of the lower animals I do not know. It may be that especial activities have been evolved by the erect posture of man, differing from the gastric motor phenomena in the lower animals.

103 Park Avenue.

ABSTRACT OF DISCUSSION

Dr. W. B. Cannon, Boston: The phenomena of systole and diastole of the stomach along with peristalsis I have observed in the dog, but I do not recall ever having observed them in the cat. In the cat the waves run along smoothly from their origin. The phenomenon of the cap I have never seen in the lower animals. As the food emerges from the stomach it is shot along the duodenum for some distance, but does not accumulate, in my experience, immediately beyond the pylorus. The phenomenon of the "cap" raises the question as to the control of the discharge from the stomach in man. In the lower animals, I believe that the evidence is pretty clear that the discharge is controlled by the acid reaction of the contents, and I should rather expect that that would be the explanation of the discharge in human beings. It would be interesting indeed to know what the effect of different foodstuffs would be on the rate of the discharge. The idea that the pylorus opens "periodically" in lower animals, is one that ought not, I think, to be allowed to prevail; at least, I am quite sure that that is not the way in which the pylorus opens in the cat and dog, if by "periodic" is meant at perfectly rhythmic intervals. As I tried to explain in a paper which I wrote in 1898, a wave coming along will discharge food through the pylorus, and then there may be no discharge for the next three waves, we will say, and the fourth wave will again discharge food through the pylorus and perhaps the next seven or eight waves may not discharge food. In other words, there is not a discharge in these animals with every wave or every fifth wave, or with anything like the rhythmicality which is observed in the peristalsis of the stomach itself.

Dr. A. J. Carlson, Chicago: The motion pictures were so confusing that I would hesitate to base any conclusion on them alone. I presume that the results with roentgenoscopy have been controlled by the fluoroscopic observations. There is no question but that Dr. Cannon's description of the action of the pylorus in cats and dogs is correct. My observation has been made on fifty or sixty animals and in every case the opening of the pylorus occurs as Dr. Cannon has described. Owing to the position of this upper end of the duodenum in man when in the upright position there may be a retention there and a tendency to dilatation; but I doubt Dr. Cole's "systole and diastole theory." It makes necessary an entirely different control of the pylorus in man than in the dog and the cat. I should like to ask for the authority for the statement that this portion of the duodenum secretes hydrochloric acid.

Dr. J. T. Case, Battle Creek, Mich.: From my experience with several thousand bismuth-meal examinations, I find I am not altogether in accord with the views expressed. Dr. Cole has made his studies roentgenographically, involving the production of numerous roentgenograms. The moving-picture films have been pieced together, so to speak, and they are not true cinematograph reproductions, and some of the happenings apparently shown by the films are, I believe, artifacts.

My observations have been made with the fluoroscope and are based on roentgenographic studies of the stomach in several thousand cases. In my opinion, a sort of systole and diastole does occur, but not in the normal stomach. I have seen the phenomenon described by Dr. Cole, but my impression has always been that the cases in which it occurred have been those of pyloric obstruction and that periodically the stomach becomes fatigued. During the periods of fatigue, peristaltic waves are not so deep as they are at other times. When the stomach becomes rested, as it were, the waves become deeper. If it were possible to make a cinematographic film extending over a sufficient period of time, taking every wave of the stomach, I believe we should find, in certain pathologic stomachs, this phenomenon described by him as systole and diastole, and yet we should see that between the two phases there would be a considerable period of time. On the other hand, Cannon's observations as regards the control of the pylorus in animals have been absolutely confirmed in my observations on man. In fluoroscopic observations, I have repeatedly seen the behavior of the pylorus as described by Cannon, the opening of the pylorus occurring irregularly. After three or four waves have reached the pylorus, one may see the pylorus open and food pass through into the duodenum. Then again ten or twelve waves may reach the pylorus before it opens again. I have not been able to observe any rhythm or regularity as to the opening of the pylorus in man.

Dr. W. B. Cannon, Boston: May I ask Dr. Case to describe his experience with the fluoroscope as applied to the cap? Is the appearance of the cap uniform?

Dr. J. T. Case, Battle Creek, Mich.: It has been hard for me to make up my mind with reference to that because so many of my cases have been pathologic and I have consequently hesitated to draw conclusions. From my observations on normal people, limited to forty or fifty persons, I must say that I have seen peristaltic waves empty the duodenal bulb completely at times. In working with the fluoroscope in favorable cases, one may see very well the succession of waves reaching the pylorus, with occasionally an opening of the pylorus and the passage of bismuth on into the duodenum. My experience with fluoroscopic observations of the stomach in man confirms the conclusions of Cannon based on animal experimentation. My conception of the function of the duodenal bulb is that it acts more or less as an equalizer, receiving the food from the pylorus and serving it into the duodenum in appropriate quantities. Holzknecht, years ago, called attention to the fact that the first part of the duodenum rarely undergoes peristaltic contraction.

Dr. E. W. Caldwell, New York: From fluoroscopic examinations which I have made I cannot agree with Dr. Cole that the shape of the so-called pyloric cap is peculiar to any individual. With the patient in different positions, and with different degrees and direction of pressure we can obtain almost any style of pyloric cap in the average person. Whenever we see the so-called pyloric cap triangular we may conclude that it is because the duodenum is deformed by pressure. I am, therefore, inclined to regard the triangular cap as an artifact.

Dr. Lewis Gregory Cole, New York: My description of the evacuation of the cap corresponds so accurately with Dr. Cannon's description of the evacuation of the antrum, that Cannon, like Hulst, may have mistaken the cap for the antrum, and the occasional peristaltic contractions, which he describes as discharging the chyme through the pylorus, are what I mean by the broad, peristaltic contractions, which begin in the top of the cap and propel the chyme through the duodenum. This broad, propulsive peristalsis of the duo denum may be controlled by an alternating acid and alkaline reaction in the descending duodenum. The relative value of fluoroscopy and roentgenoscopy is not a question to discuss before this section; but when the cap is shown in every one of forty plates, how can you doubt its presence, even though it is seen only occasionally on the fluoroscopic screen. Astronomic observations are based, not on ocular, but on photographic records. Photograph a man walking, and the snapshot will picture his feet in an incredible position. Similarly, I do not understand how you can discredit the definite evidence of the cap afforded by the permanent records of serial radiography. The photographs are assembled in the order of the progression of the peristalsis, and double exposures, made about one-half second apart on the same plate, provide the key which locks them together. Dr. Case says that he has not observed the systole and diastole fluoroscopically. By making a series of roentgenograms and comparing the extremes of systole and diastole, he will find a motor phenomenon not accounted for by the progression of peristalsis, and not readily recognized fluoroscopically. Furthermore, it is a phenomenon different from the periods of repose that occasionally occur during gastric digestion. The systole and diastole occur once during each cycle, which corresponds in time with the formation and duration of an antrum. The antrum exists for about seven seconds, I believe. The length of the cycle varies in different people, and I should rather not state the average time. Photographs made about four seconds apart show the extremes of systole and diastole. The peristaltic wave persists about twenty seconds from its origin at the fundus to its termination at the pylorus, not twenty seconds for its progression along the last two inches of the stomach. The systole and diastole correspond in time with the wave. I have my own opinion of the average length of time, but do not care to name it. I do say, however, that it corresponds with the formation and duration of each antrum or cycle.

UNIQUE WRIST INJURY

RECURRENT ANTERIOR DISLOCATION OF ULNA *

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History.—Mrs. R., aged 36, Feb. 28, 1910, fell down-stairs and in some way hurt her left wrist. She immediately came to my office three blocks distant. Walking into the consultation room she held out her forearm in medium pronation, the hand and fingers slightly flexed. The patient thinks now that the hand was somewhat drawn to the ulnar side. I noticed an abnormal protuberance on the dorsum of wrist and made a hasty (before examination) diagnosis of Colles' fracture.

Examination and Treatment.—I examined the wrist and soon discovered that there was not a Colles' fracture; nor could I make out any fracture, except possibly one of the ulnar styloid. It was discovered that the ulna was dislocated forward and that it was easily reduced, but that when the pressure which was needed to reduce it was released, dislocation recurred. Motion in all directions was somewhat limited on account of pain. The deformity on the back of the wrist could not be reduced by manipulation or by pressure. By means of adhesive strips and an anterior splint the dislocation of the ulna was maintained. Rest of the part was advised for several weeks. In the meantime the splint was readjusted several times, but finally abandoned. At no time did the ulna show any tendency to remain in its normal place except when it was held there by some retaining force. The patient was finally advised to wear a wristlet and to use her wrist and hand as much as she could. A roentgenogram made March 30, 1910, a month after injury, did not show any fracture. In June, 1911, more than a year later, the patient returned, complaining of pain and weakness in her wrist. Two roentgenograms, one dorsal and one palmar, were taken. These pictures showed no fractures or any marked or complete dislocation, except that of the ulna. The patient was again advised to wear a wristlet. Motion was practically normal. The patient did not wear the wristlet long, but soon used her hand as much as ever.

Present Condition.—At present the wrist has practically normal motion, except that the patient has some hyperextension and somewhat limited flexion. It is nearly as strong as her right wrist. The patient does all kinds of heavy housework, using the left wrist without a support. She has no pain in the wrist. The deformity on the back of the hand persists. The inferior end of the ulna projects anteriorly *when the hand is in supination.* It is freely movable and is easily replaced; in fact, it reduces itself when the hand is pronated. It can be felt slipping back into the sigmoid cavity of the radius as the hand passes from supination to pronation. I cannot make out the triangular fibrocartilage, but it evidently must be ruptured, judging from the abnormally free range of motion of the end of the ulna and the ease with which it slips back into place. We may safely infer, in addition, that the anterior radio-ulnar ligament is ruptured. The dislocation of the ulna is clearly shown in the roentgenogram of this wrist (made by Dr. Lemon) in lateral view. This picture shows the ulna protruding far to the palmar side of the wrist.

We must yet account for the deformity on the back of the wrist. Here we find ourselves on debatable ground. Through the kindness of Drs. Lemon and Haywood I have had several roentgenograms of this wrist for study and examination and have freely consulted their opinions as to their interpretation of the plates. My present conclusion is that there is a slight backward dislocation of the radiocarpal joint, and that the carpals, though none of them are dislocated, are crowded together, and some of them more or less rotated on their axes, or possibly even slightly dislocated. As to the first part of my conclusion, subluxation backward of the radiocarpal joint, the fact that the deformity is on the back of the hand speaks for backward rather than forward dislocation. Other evidences of backward displacement are the diminutive size of the hypothenar eminence and the fact that the whole wrist and hand lie on a higher or more dorsal plane than normal, carrying with them the ridge and tubercle of the scaphoid and trapezium, so that they lie deeper in the wrist than normal. However, there is not complete luxation backward, first, because motion never was limited enough for that; secondly, because deformity was not great enough, and thirdly, because the roentgenograms do not show complete luxation.

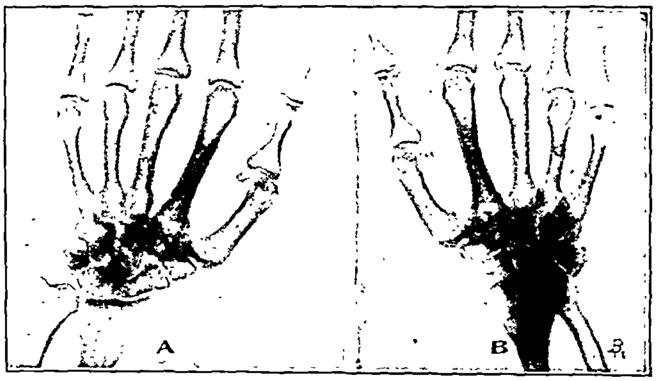

Fig. 1.—*A*, normal wrist (right); *B*, injured wrist (left). Shows crowding together of carpal bones, subluxation of radiocarpal joint and overriding of semilunar and os magnum.

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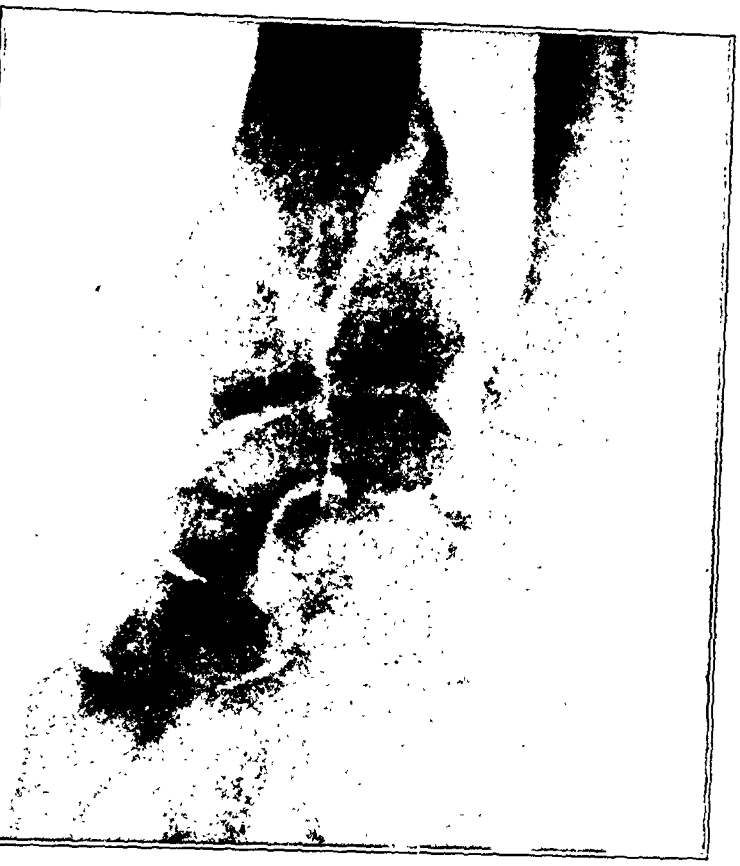
* Read at the Elkhart County Medical Association at Goshen, Ind., March 6, 1913.

LONGITUDINAL FRACTURE OF THE LOWER END OF THE RADIUS TOWARD THE ULNAR SURFACE

James C. Wilhoit, M.D., Manhattan, Kan.

Longitudinal fractures of the lower end of the radius are exceedingly rare. Cotton[1] speaks of only three specimens. Parrish[2] and Bendell[3] probably have the only roentgenographic illustration of the lesion. So far as I can learn, this case is the only longitudinal fracture of the radius that split toward the ulnar surface.



Longitudinal fracture of lower end of radius.

J. H. G., farmer aged 38, May 3, 1913, was boxing hats; his antagonist caught him by the fingers of his right hand and in jerking to free himself he felt something in his wrist snap. He consulted me the day of the injury and on roentgenoscopy the fracture was located.

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1. Cotton: Dislocation and Joint Fractures.
2. Parrish, R. C.: Longitudinal Fracture of the Lower Extremity of the Radius, The Journal A. M. A., Jan. 11, 1913, p. 123.
3. Bendell, J. W.: Longitudinal Fissured Fracture of the Lower End of the Radius, The Journal A. M. A., May 17, 1913, p. 1537.

Gentleness in Surgery.—The fact that some operators produce little constitutional disturbance, little shock, by the performance of an operation which at the hands of another causes very serious collapse, is not due to differences in the patient, in the anesthetist, in the method, or in anything else but the surgeon himself. There are surgeons who operate on the "canine" principle of savage attack, and the biting and tearing of tissues are terrible to witness. These are they who operate with one eye on the clock, and who judge the beauty of any procedure by the fewness of the minutes which it has taken to complete. There are other surgeons who believe in the "light hand," who use the utmost gentleness, and who deal lovingly with every tissue that they touch. The former type of operator is described by Crile as "carnivorous;" the latter type is nowhere better exhibited than in his own work. The scalpel is, indeed, an instrument of most precious use—in some hands a royal scepter; in others but a rude mattock. The perfect surgeon must have the "heart of a lion and the hand of a lady;" never the claws of a lion and the heart of a sheep.—Sir Berkeley Moynihan, Address in Surgery, Brit. Med. Assn., 1913.

A FATAL CASE OF COCCIDIOIDAL GRANULOMA

Philip King Brown, M.D., San Francisco

History.—The patient was a Yaqui Indian, aged 30, speaking no English (history obtained through interpreter). He worked at McKittrick, San Joaquin Valley, California, with construction gang. He knew nothing of his family history. He said that he had never been sick before and denied venereal diseases.

Present Trouble.—July 25, 1911: Patient said that he had been sick for ten days. He felt warm and had pains all over him, in shoulders, hips and all joints. He had coughed for several months and had had some pains in the lungs. A couple of weeks after admittance, patient said that he had no pains anywhere, no chills and no sore throat, but that he had perspired freely day and night.

Physical Examination.—There was no evidence of a lesion anywhere. The heart-tones were clear and strong; there was no cough; there were no signs in the lungs of any trouble. The pain in the joints of which he complained was not bad, and there was no evidence of swelling or tenderness. Even the pain in the joints disappeared without medication and did not return. The urethra and prostate presented no sign of trouble. The tonsils were slightly large but not inflamed. Widal and Moro reactions were negative. Blood-culture, urine and stools were negative. The blood-count was 24,650 at time of entrance, but three weeks later was normal.

Treatment and Course.—The progress of the disease was without incident except for the fever and failure to determine the nature of the infection. At the end of two weeks, because of negative findings, a mixed vaccine was used on the patient, pneumococci and streptococci predominating. There was no effect from this after two weeks and vaccine treatment was discontinued. The pulse was slow and the temperature ranged 3 or 4 degrees daily and was very irregular, ranging from 95.6 to 104 F., and going below normal several times.

The patient grew gradually weaker, râles developed in the lungs and he died fifty days after entering the hospital.

Laboratory Reports.—July 26, 1911: Urine: dark yellow; specific gravity, 1.015; reaction acid; sugar negative; albumin negative. Microscopic examination showed amorphous urates and a few finely granulated casts. Diazo-reaction negative. Widal negative.

Aug. 3, 1911: Widal, negative; blood-culture, negative. Differential blood-count: polynuclears, 76.5 per cent.; eosinophils, 4.5 per cent.; large lymphocytes, 1 per cent.; small lymphocytes, 18 per cent.

Aug. 4, 1911: Moro reaction negative.

Aug. 11, 1911: Sputum: elastic tissue, none; bacilli of tuberculosis, negative; diplococci, some; streptococci, many. Several days later sputum examinations showed absence of tubercle bacilli but presence of many diplococci and streptococci.

Feces: No pus, mucus or ocult blood; no ova or parasites.

July 27, 1911: White blood-cells, 24,560.

Aug. 15, 1911: White blood-cells, 9,000.

Sept. 11, 1911: White blood-cells, 11,150; blood-culture, negative; bacteriologic examination of catheterized specimen of urine, negative; palpation of prostate, negative.

Necropsy.—By Dr. W. T. Cummins. Typical lesions of miliary tuberculosis in lungs with fewer lesions in the other organs. The primary focus was the lumbar lymph-nodes which were soft and caseous, fluid pus showing in certain of them. It was not until sections were made of these lymph-nodes and the lung that it was discovered that the lesions were due to the coccidioidal organisms. There were no ulcerations in the intestines.

Characteristics of the Preceding Case.—The initial lesions were in the lumbar lymph-nodes, whereas in about 70 per cent. of the cases the lesions were primarily in the lungs. There were no skin lesions, which are present in at least one-third of the cases. Blood-cultures were tried on three occasions and were negative; in no previous case, so far as I know, had blood-cultures been tried. The duration of the case could not have exceeded two months from the onset of the symptoms. The only other case as acute, in which the initial lesions were also in the intestinal tract is Case 15, of a duration of two and a half months.[1]

350 Post Street.

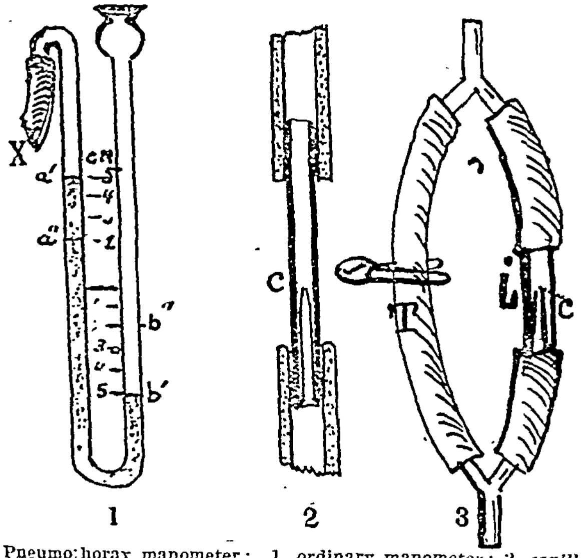
THE PNEUMOTHORAX MANOMETER

Edward von Adelung, M.D., Oakland, Cal.

I have been surprised to note that while all physicians who employ artificial pneumothorax agree on the great importance of being closely guided by the manometer readings, they are reading their manometers in different ways. As in many other instances in which the records of one man must be compared with those of others, it is of crucial importance that a uniform method of recording be agreed on.

The commonly used manometer is constructed as depicted, Figure 1, being simply a U glass tube filled to zero with a fluid, water. Thoracic pressures are transmitted through a tube, *x*, and depress or "suck up" the fluid. If the pressure varies, as during breathing, of course the columns will oscillate.

For example, the left column (Fig. 1), under negative pressure, oscillates from a′ to a″, and simultaneously the right oscillates from b′ to b″. During breathing they are in constant motion. Now the question answered so variously is, How should the manometer be read? Should one read in this case negative pressure 5, the figure to which the left column rises; 2, the lowest mark above zero that it reaches; 10, the *difference* between the tops of the two columns when at their maximum, or 4, the difference between them when they are at their minimum? Or, as some have suggested, should one read the averages: half the difference of the maxima or 5, or half the difference of the minima, or 2? Or should one read half of the oscillation between the maximum and minimum on one side of the manometer, in this case 3.5? Or finally, should this figure be doubled, making the reading 7? Such is the confusion of possibilities that present themselves to some minds.



Pneumothorax manometer: 1, ordinary manometer; 2, capillary link; 3, tube leading to manometer.

Of course there can be but one correct reading. Physics has long ago made clear that the pressure is measured by the column of fluid supported. Now the column supported is that portion of the longer column above the top of the shorter. The correct maximum reading in the given example is therefore negative 10, while the correct minimum reading is negative 4; but under these conditions some might read maxima and others minima, so we still have something to agree on. *It is suggested that the mean pressures be recorded.* In this case the mean pressure is negative 7.

I wish now to call attention to an attachment for the manometer which I discovered, by means of which the mean pressure can be read directly, a means of practically obliterating the oscillations, thus giving a positive-reading manometer for mean pressures. If this attachment were generally adopted differences in readings would vanish. The attachment is inexpensive, easily constructed, and applicable to any manometer. It is shown in Figure 2.

A capillary tube is fixed in a heavier tube (for protection) so that the pressure must pass through the small opening, *c*. This device is placed in one limb of the divided tube that leads to the manometer, as shown in Figure 3. When the rubber limb, *T*, is pinched off, forcing all pressures to reach the manometer through the link *L*, positive mean pressures will record with practically no oscillations; but the oscillations are necessary to prove the position of the needle. If tube *T* is left open oscillations occur as usual. Thus both uses of the manometer are readily available.

New and Nonofficial Remedies

The following additional article has been accepted by the Council on Pharmacy and Chemistry of the American Medical Association. Its acceptance has been based largely on evidence supplied by the manufacturer or his agent and in part on investigation made by or under the direction of the Council. Criticisms and corrections are asked for to aid in the revision of the matter before publication in the book "New and Nonofficial Remedies."

The Council desires physicians to understand that the acceptance of an article does not necessarily mean a recommendation, but that, so far as known, it complies with the rules adopted by the Council.

W. A. Puckner, Secretary.

BACILLUS OF BORDET-GENGOU VACCINE.

Sophian-Hall-Alexander Laboratories, Kansas City, Mo.

Whooping-Cough Vaccine (Bordet-Gengou Bacillus).—This vaccine is prepared from the Bordet-Gengou bacillus derived from a case of whooping-cough. Marketed in ampoules containing respectively 100 million, 350 million and 500 million killed Bordet-Gengou bacilli.

Therapeutics

BRASS-FOUNDERS' OR ZINC AGUE

This not infrequent and often unrecognized condition has been carefully investigated by Dr. Emery R. Hayhurst of Chicago.[1] Men who are exposed to the fumes of molten metals are more or less likely to become poisoned. With lead and mercury this has long been recognized. Perhaps there is no poisoning from pure molten iron or copper, but some one or more elements in brass, bronze, German silver, etc., may cause a peculiar condition termed "brass-founders' ague," and Hayhurst's investigations have shown that the more the fumes are inhaled, the more likely is this ague to occur; the more confined the room the more likely is it to develop. This is noticeable from the greater number of cases of poisoning in the winter than in the summer months when the windows and doors are open, and the weaker an individual, the more liable is he to have it.

Brass, it may be remembered, is composed of copper and zinc. The zinc often predominates, as it is the cheaper of the two metals. Bronze is a mixture of copper and tin.

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[1] The following reviews of the cases may be found: Ophüls: Jour. Exper. Med., vi. Brown, P. K.: California State Jour. Med., December, 1906, p. 324. Brown, Philip King: Coccidioidal Granuloma, The Journal A. M. A., March 2, 1907, p. 743.

[1] Hayhurst, Emery R.: Am. Jour. Med. Sc., May, 1913, p. 723

While those who inhale the fumes of these metals when molten are most likely to be poisoned, those who are subjected to the dust from polishing or handling them (especially when the metals have become oxidized or carbonized) are also likely to have poisoning, although perhaps not so severe. They may have gastric disturbances, irritation and inflammation of the gums, and perhaps some forms of eczema.

The most important symptom of brass-founders' ague is the chill, with more or less fever and then sweating. With some persons this chill may occur shortly after inhaling the fumes, while others may withstand such inhalations until the latter part of the day, or may regularly be tolerant to a certain number of inhalations a day; but even in cases in which such tolerance is found, the person may have a chill if these fumes are repeated often during the day.

Besides the symptoms already mentioned, the mouth and throat are dry, there is more or less dry cough, a feeling of tightness in the chest, a metallic taste in the mouth and loss of appetite; nausea and vomiting may or may not occur; headache is generally present and sometimes severe backache and leg pains. With more or less lengthy prodromes a chill generally develops, and the patient may be chilly for from one to three hours. He is not readily warmed, even with blankets and hot-water bags, although hot drinks are a comfort to him. The pulse-rate is generally greatly increased. There is not always a rise of temperature before the crisis and the development of perspiration. With the perspiration comes prostration, weariness and drowsiness, and the patient sleeps. The attack may last, says Hayhurst, from five to twenty hours. When the patient recovers from the attack, which is more or less like a malarial chill and fever, he is pretty well, except that he may feel somewhat weary and may not have his usual appetite. Hayhurst says that the urine invariably shows albumin and casts after a severe chill. This soon clears up. No changes in the blood have been noted.

These chills are more likely to occur in the latter part of the afternoon, in other words, after more or less repeated or prolonged exposure to the fumes or dust of the metals; they may not occur, however, until the cool of the evening when the chilling seems to precipitate the ague.

Hayhurst's investigations seem to show that about 70 or 80 per cent. only of the workmen in these occupations are susceptible to the poison and experience the chills; hence, there must be some natural immunity. A tolerance also occurs in from 70 to 75 per cent. of the men who work steadily at the trade. The other 25 per cent. are poisoned more or less regularly, but rarely sufficiently to cause a change of occupation. Weak and anemic persons and women are more susceptible to the poisoning than the stronger men.

Investigations have shown that men in these occupations are more or less addicted to alcohol. This is largely owing to the belief that whisky especially is an antidote against this form of poisoning. Investigations have also shown that these men do not live so long as men in many other occupations, and the mortality from pulmonary tuberculosis is much greater than in most occupations.

Although it has not been definitely shown that it is the zinc which causes this kind of poisoning, it is quite probable that zinc is the metal.

Since treatment in these cases is not satisfactory, no specific treatment having been discovered, prevention is of more than usual importance. It is self-evident that in the manufacture and the handling of these metals and combinations of metals, factories and furnaces should be so equipped that the dust will not be inhaled, and the fumes should be sucked up the chimneys by fans and blowers so that it will be impossible for the workmen to inhale them. While sponges and various respirators have been used over the nostrils and mouth, resort to such measures should be necessary only in individual instances. Women and boys should probably not be employed in these industries; their general health should certainly be considered and anemic persons and those with a tendency to tuberculosis should be refused acceptance as employees in factories of this kind. Much on the plan of those who handle lead, frequent baths should be taken, the hands should be thoroughly washed before eating, and the workmen should not eat in the foundries.

The only symptomatic treatment advisable seems to be hot drinks, sometimes emetics and the administration of hot milk. Of course, if there is severe pain, a hypodermic of morphin must of necessity stop it, and theoretically would be good treatment. More or less all these patients probably need iron and bitter tonics.

While no distinct pathologic condition is known to follow these acute poisonings, repetitions of the poisoning or continued exposure to the cause, whether dust or fumes, sooner or later allows respiratory, urinary, or perhaps nervous disturbances to develop. Instances of neuritis have been known to follow such poisoning.

LEAD-POISONING

In communities in which there are industrial plants handling lead, poisoning from this source is frequent. It has been shown that the most poisonous or the most soluble forms of lead are not necessarily the most likely to cause accidental poisoning. Those that most readily form dust seem to be most harmful, the more the dust is abolished, therefore, in all forms of lead factories and lead industries, the less the poisoning. There is no question, of course, of the danger of lead fumes from molten lead.

The subject of industrial lead-poisoning has been carefully investigated by Dr. Alice Hamilton[2] of Chicago. She came to the conclusion that the most poisonous of the lead salts is probably the suboxid which forms on the surface of melted lead, is given off in fumes at high temperatures and also rubs off on the hands of the lead-workers; it is this salt that causes poisoning in smelters, molders, type-setters, plumbers and others. The other forms most likely to cause poisoning are litharge or oxid of lead, and then the higher oxids of lead, as red lead, and the carbonate of lead, or white lead. Those who clean or scrape off lead paint, and also painters, are likely to have poisoning from white lead. Lead-poisoning occurs frequently in factories in which men work in white lead, and in oxid of lead or red lead, and Dr. Hamilton finds that those who work in red lead are poisoned sooner than those who work in white lead.

She believes that a weak sulphuric acid lemonade, which workmen were urged to drink, is not a protective against lead-poisoning. It has been proved that most forms of lead will be so acted on by the gastric juice during digestion that some lead will be absorbed. The only harmless lead seems to be the sulphid of lead. A recent article of Drs. Carlson and Woelfel[3] reports the results of a special investigation as to the solubility and absorption of the different kinds of lead. This investigation was made at the request of Dr. Alice Hamilton.

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[2] Hamilton, Alice: Industrial Lead-Poisoning in the Light of Recent Studies, The Journal A. M. A., Sept. 7, 1912, p. 777.

[3] Carlson, A. J., and Woelfel, A.: The Solubility of Lead Salts in Human Gastric Juice and Its Bearing on the Hygiene of the Lead Industries, The Journal A. M. A., July 19, 1913, p. 181.

The amount of lead necessary to cause poisoning varies greatly, probably according to idiosyncrasy, some persons being susceptible, others being tolerant. Some artisans, therefore, may work in lead for years without evidence of poisoning, while others can work but a few weeks before poisoning is apparent. *Investigations* in some of our factories, Dr. Hamilton says, showed that from 25 to 35 per cent. of the employees had some form of lead-poisoning. Negroes seem more susceptible to lead than white men, and women are probably more susceptible than men. Fatigue, improper housing and insufficient food all render the individual more susceptible to lead-poisoning and its anemia, as we would logically conclude. Those who drink much alcohol are more susceptible to the poisoning, and the tendency to drink beer or whisky in order to remove the sickish, disagreeable, sweet taste from the mouth due to the lead salts that are inhaled or swallowed is great with men in these employments. Women, on the other hand, drink a good deal of tea, or crave sour things, to overcome this disagreeable taste.

It has not been shown that lead is positively absorbed from the skin, or that much is absorbed when inhaled into the lungs; probably most of the poisoning is caused by lead being swallowed into the stomach.

The diagnosis of chronic lead-poisoning is sometimes difficult, and for that reason every one should be questioned as to his possible exposure to lead, after other more tangible causes are excluded, if he loses appetite, is pale or anemic, is constipated and suffers from indigestion. These are all prodromal symptoms. The blue line on the gums may or may not be present. If the teeth and mouth are properly cared for the blue line is probably not often found. "The basophilic granulation of the red cells," which was thought at one time to be diagnostic of chronic lead-poisoning, has been shown not to be pathognomonic. Lead may or may not be found in the urine of patients who show other signs of lead-poisoning; therefore its absence will not exclude lead-poisoning. It has been suggested, in cases in which the patient is working in lead and poisoning is suspected, that a soluble sulphid be rubbed on the skin, on the theory that lead is excreted through the skin, and that if a black precipitate is formed, it will show that there is lead in the tissues.

Dr. Hamilton concludes that, although one attack of acute plumbism is not serious and may leave no diseased condition, one attack does predispose to another, and that probably a man who has had one attack of acute colic, for instance, or of wrist-drop, certainly should be ordered to stop working in lead, and that the employer should refuse him employment. The later pathology of chronic lead-poisoning becomes that of cardiovascular-renal disease on the one hand, or progressive anemia, weakened muscles, especially the extensors, tremor and emaciation.

In this anemia nucleated red corpuscles are almost always found, even if the anemia is not profound.

Lead colic may occur suddenly, or after protracted constipation, with or without gastro-intestinal pains, During the paroxysm the patient generally vomits, the pulse is slowed and the blood-pressure is generally raised. Nothing will stop this kind of pain but large doses of morphin, used in combination with atropin. Hot fomentations to the abdomen should be used, or better, if the patient is able, a hot bath should be taken. As soon as the pain is less severe the patient should receive a saline cathartic, and best perhaps Rochelle salt, as, in spite of the usual innocuousness of magnesium sulphate, it should not be forgotten that, occasionally, if magnesium sulphate does not cause purging and is absorbed, it can cause nervous depression not dissimilar to that which may occur from lead.

The after-treatment of lead-poisoning of this nature, or if chronic lead-poisoning is diagnosed without lead colic occurring, is a daily morning dose of *Rochelle salt* or something similar and the administration of small doses of sodium iodid. The dose of iodid should, as a rule, be small, not more than 0.20 gm. (3 grains) three times a day, after meals, as large doses may cause more lead in the system to become soluble than is desired, and more acute symptoms of lead-poisoning to occur. Anything that builds up the nutrition is also good after-treatment for chronic lead-poisoning; for example, the administration of small doses of iron, and the prevention of high blood-pressure and a possible beginning cardiovascular-renal disease.

If lead palsy, which in its most frequent form is wrist-drop, is present, the tonic treatment mentioned before should be carried out with the addition of strychnin and the use of electricity and massage.

Acute cerebral symptoms not infrequently occur. These symptoms may be a delirium, convulsions, epileptiform in character, or more or less coma. Occasionally hallucinations and insanity are caused by the action of lead on the brain. These conditions are all exceedingly serious. While wrist-drop is generally curable, more profound paralysis of the arms and legs is much more serious.

Prevention, of course, should be considered by every employer and should be understood by every employee who has anything to do with industries that make or handle lead. The prevention of lead-poisoning is much the same as previously described in the prevention of zinc ague, and a patient who has once been poisoned by lead should either leave his occupation or should inaugurate such means of prevention of future poisoning as are efficient. Personal cleanliness is one of the greatest factors in the prevention of lead-poisoning.

The Bureau of Labor[4] at Washington has issued a bulletin which describes the causes and prevention of lead-poisoning both in Europe and this country, representing the investigations of Oliver in Europe and of Alice Hamilton and John Andrews in this country.

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[4] Bulletin 85, Bureau of Labor, Washington, 1911.

Infection of Swimming-Pools.—Most modern swimming-pools have certain provisions which aim to prevent the contamination of the water. At many of the swimming-pools, the walks are so constructed that any water splashed on them drains away from the pool; expectoration in the pool is prohibited and nude bathing for men is the general rule. At many places each bather is required to take a preliminary bath before entering the water, but unless a conscientious attendant is constantly on duty this preliminary bath may be very superficial with many of the bathers. Medical examination of the persons using the pool, is required in some cases, but such examinations are usually made at such infrequent intervals as to provide only a small measure of safety from infection. Of the thirty-five swimming-pools reported by Mannheimer, at only twenty-three medical examination was made before a person was permitted to use the pool, and with very few exceptions no subsequent medical examination was made. At only eleven of these pools was there any inspection of those *entering*, and at only one was every one required to pass through the shower-room on the way to the pool.—Clark and Gage in *Bull. Mass. State Board Health.*

THE JOURNAL OF THE
AMERICAN MEDICAL ASSOCIATION

535 Dearborn Avenue . . . Chicago, Ill.

Cable Address . . . . "Medic, Chicago"

Subscription price . . . . . Five dollars per annum in advance

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SATURDAY, SEPTEMBER 6, 1913

THE SIGNIFICANCE OF FORMIC ACID IN THE URINE

It would work a great step in advance in our understanding of the chemical processes of the organism and unquestionably render much assistance in the interpretation of the various perversions of the nutritive functions if all the important steps in the life-processes of the body were adequately known. The discovery and recognition of these intermediate stages is rendered peculiarly difficult owing to the fact that many of the products which unquestionably arise as transition fragments in the destruction of larger nutrient molecules escape detection because they are themselves speedily further altered by oxidation, reduction or other chemical reactions, until step by step the end-products are reached without the disclosure of any of the transitory stages. Only when some of these evanescent intermediate compounds crop out by accident, as it were, are we made to realize that they are incidents in the story of degradative changes in living organisms.

The present research in metabolism is particularly concerned with the appreciation of such intermediary products and the processes by which they arise. Accordingly one reads more frequently than formerly of lactic acid and the various ketone compounds, acetone, diacetic acid, beta-oxybutyric acid, of hydroxyacids and ketonic acids all brought into growing prominence by the newer point of view which is being presented. This phase of physiology, full of the promise of revelations in respect to the detailed chemical workings of the body, is still in an early state of development. The novelties of the subject are still brought to our notice in isolated instances. Formic acid, for example, has lately commanded attention as a possible transition product. Its comparatively simple chemical structure, H.COOH, at once suggests plausible relationships to all the familiar foodstuff radicals. The fact that small amounts of formic acid are now known to be excreted constantly in the urine makes it appear not improbable that this substance may be formed in the body as an intermediate product of oxidation in large amounts, of which only a very small proportion escapes complete oxidation and is excreted.

Dakin, Janney and Wakeman[1] have started a search for the source of the formic acid which escapes through the kidneys. Some conception of the quantitative relations involved may be gained from the analyses of normal human urines of persons on mixed diets. The formic acid content ranged from 30 to 118 mg. per day, with an average excretion of 60 mg. It is in part of endogenous origin, the output falling during starvation to about one-third the normal amount.

The excretion of formic acid is greatly increased when carbohydrates are given. It is known that many intestinal micro-organisms may not only ferment, but also produce formic acid from both carbohydrates and proteins.[2] Accordingly it might be assumed that the formic acid of the urine has its ultimate source in products of alimentary bacterial activity. This explanation is rendered less tenable by the fact that a marked increase in the urinary output was found to follow the intravenous injection of glucose into the organism. Protein feeding is attended with a similar but smaller increase in formic acid output. Such findings, therefore, point to this compound as a product of the intermediary metabolism of both carbohydrates and proteins. The chemical analogies between some of the processes and products of fermentation and metabolism are constantly being reasserted.

CANCER STATISTICS

The formation of committees and other agencies for the study of cancer in many countries is leading to the collection of data that are of much interest and also in all likelihood of great significance.

As frequently noted, statistics in general seem to reveal an increase in cancer; but whether this may not be the outcome of greater accuracy in diagnosis is a question concerning which there is still a difference of opinion. Obviously, on the basis of the figures and facts now available, the solution of the question as to whether or not cancer is on the increase is most difficult. In the future the conditions for reliable comparisons will be more satisfactory.

The reports on cancer statistics coming from different countries are sometimes so much at variance as to suggest either that the mode of life and external conditions must play a large part in cancer or that the statistics given do not represent the true state of affairs. One example of this discrepancy may be cited. It is generally believed that cancer affects women much more frequently than men. Statistics from England and other countries indicate that it is so; but in Norway this does not seem to be the case.

Soegaard's[1] recent analysis of the statistics gathered in Norway by the Norwegian cancer committee reveals conditions in that country which are highly remarkable. In the first place the figures show a greater number of men to have cancer than women. The difference in favor of men is not large—of 37,046 deaths from cancer during 1865-1895, 18,413 were in men and 18,633 in women, who constitute 51.5 per cent. of the Norwegian population—but the point is that here the conditions noted in many other countries appear to be reversed. The Norwegian statistics also show a preponderance of cancer of the stomach, which is not the case in statistics from other countries. In a series of 9,528 deaths from cancer, 5,990, or 62.9 per cent., were caused by cancer of the stomach. For the ten years 1896-1907 following the period covered by this series, there were 19,263 deaths in Norway due to cancer, of which 12,582, or 65.3 per cent., were from cancer of the stomach. In the province of Nordland there were 1,235 deaths from cancer during 1896-1907, of which 913, or 73.9 per cent., were from gastric cancer. Another remarkable feature of the Norwegian statistics is the comparative infrequency of cancer of the female genital organs in Norway. The highest percentage of any district is only 8.3 per cent., while the lowest is 2.2 per cent. In considering this unusually low percentage Soegaard suggests that the explanation may be the small amount of gonorrheal infection in the Norwegian women.

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[1] Dakin, H. D., Janney, N. W., and Wakeman, A. J.: Studies on the Conditions Affecting the Formation and Excretion of Formic Acid, Jour. Biol. Chem., 1913, xiv, 341.

[2] For literature on this point see Steppuhn, O., and Schellbach, H.: Ueber die Ameisensäure als Zwischenprodukt der tierischen Zuckerspaltung, Ztschr. f. physiol. Chem., 1912, lxxx, 274.

[1] Soegaard: Die Krebsformen Norwegens, Ztschr. f. Krebsforsch., 1913, No. 13, p. 89.

We see then that the statistics from Norway, evidently gathered with great care and under favorable conditions, differ in three distinct points from the other figures: They show a greater frequency of cancer in men, a greater frequency of cancer of the stomach, and a comparative infrequency of cancer of the genital organs of women. What can this mean? Either that statistics are at fault or that social and other conditions play a decisive part in the development of cancer. If the latter is the case, which seems reasonable enough, the fundamental importance of accurate statistical studies of cancer under different conditions is self-evident. If these studies reveal that in certain countries, communities or districts there prevails cancer of certain organs or of certain types, then the next step would be to discover and eliminate the conditions on which the prevalence depends. There is great need in this country for the accurate study of cancer from this angle.

THE ITINERANT QUACK

The man who comes to the small town with a cheap stock of shoddy clothes, rents a store for a few days or weeks, and by means of flamboyant advertising disposes of his worthless goods to the "suckers" of the locality is looked on by reputable business men as a detriment to the community. Decent men of the town recognize that while the owner of the store rented and the proprietor of the local newspaper may make a little money out of the visit of the fly-by-night merchant, the town as a whole is the worse for the visit. So generally is this admitted that most towns and villages impose a heavy tax on undesirable citizens of this type.

The itinerant quack bears the same relation to the community as the transient clothing-store proprietor, with this difference: while in the one case the unsophisticated are relieved of their money without getting value received, in the other, they also run the risk of losing their health as well. The business men of country towns, however, do not so easily recognize the harm that the traveling doctor does as the damage that the traveling merchant causes. One reason for this is, of course, the fact that the traveling quack is not a competitor of the local business man. Should the local physicians protest, their objections are discounted on the ground that it is a case of "professional jealousy." Rural towns, however, are gradually waking up to the fact that the visit of the itinerant doctor is just as much a calamity as the visit of the itinerant merchant. And, naturally enough, the editors of the country newspapers are among the first to call public attention to this fact. We say naturally because the men editing the country newspapers are, as a class, among the leaders of thought in their communities. From a selfish point of view, the local newspapers might be expected to be the last ones to have anything detrimental to say about the class that brings in a handsome advertising revenue.

The *New Teller* is published at York, Neb. It received an offer of an advertisement from a Dr. A. A. Potterf of Kansas City, who was going to pay a visit to York in the hope, doubtless, of catching some persons who think that their home physicians know less than traveling quacks. Of course the editor did not know that Dr. A. A. Potterf was a graduate of a low-grade homeopathic school that is now out of existence; that while the doctor has been practicing medicine for a quarter of a century he is so little known in his home town that reputable physicians of Kansas City have never heard of him; that in spite of his alleged qualifications, he is not a member of the county or state medical societies. The editor of the *New Teller* did not know, and could not be expected to know, these things; but he did know that physicians who are above the average in knowledge and skill do not go quacking it around the country. Knowing this the *New Teller* published the following open letter on the front page of its issue of July 30. It is worth reading:

> "*Dear Doctor:*—Your ad. copy and express money order received. We regret very much that you contemplate another visit to York in the near future. We regret just as much not being able to keep the money order—it looks good to us. However, the *New Teller* has managed to struggle along several months without any such advertisements. We are mercenary enough to indulge in the hope that you will file your certificate with the county clerk, and pay the small fee required by the law, though this little matter is as a rule neglected by the traveling fraternity of your calling.
>
> "Owing you no personal enmity, we can't help expressing the wish that the city of York might find some way to benefit by your stay in this city to the extent of at least fifty dollars a day. Not so long ago, an itinerant pedler might rent a

> store-room in York, put in a cheap stock of overalls, gilt watches, and in the course of ten days wind up with an auction sale. This proceeding would now cost him too much.
>
> "You may be a good doctor—a most excellent doctor. As such you might build up a lucrative practice in Kansas City and be saved the toils and hardships incident to constant traveling. [A delightful piece of gentle sarcasm.—Ed.] There are already many good doctors in York—plenty, in fact. As they make their homes here, the people have a fair chance to judge them. The people don't have a fair opportunity to become acquainted with you. We believe this community would be as well off without the visits of 'United Doctors,' 'Doctor Specialists,' and the like, and have said so in a variety of ways. We believe the person with defective eyesight should consult an oculist, rather than patronize a spectacle pedler. If pedlers we must have, let them aid materially in cutting down the heavy burden of the taxpayers.
>
> Very respectfully,
>
> The New Teller.
>
> "The above letter also applies to 'The Old Reliable State Medical Institute' of Omaha, which forwards ad. copy under date of July 29, announcing a three days' visit to York. The Institute may be old and it may be reliable. It may be several other things. It should be remembered that a quack doctor is more dangerous and vastly more expensive than patent medicines. The public is now protected to a certain extent against the latter."

Could the facts be stated more simply or more accurately? A letter like this makes the readers of the newspaper think, and quackery cannot thrive among people who think! Some day it will dawn on the public generally that the doctor who can treat any kind of ailment a little better than the general run of doctors does not need to spend money advertising that fact, nor is it necessary for him to assume "the toils and hardships incident to constant traveling!"

THE NATURE OF GENERAL PARALYSIS

The most important advance in our knowledge of general paralysis since its relation to syphilitic infection became generally accepted is the demonstration by Noguchi and Moore[1] of *Spirochaeta pallida* in the brain of paralytics. That their failure to find the spirochete in more than about 25 per cent.[2] to a large extent depended on technical reasons is indicated by the results obtained by Levaditi, Marie and Bankowski.[3] These investigators, using other methods (Fontana, etc.) and examining each cerebral convolution systematically, were able to demonstrate the spirochete in the brains, freshly obtained, from eight of nine cases of typical general paralysis. By the silver method the spirochete was found in only one of the nine cases. It is of importance that in all of the eight positive cases death occurred in a paralytic or apoplectiform attack, whereas in the negative case it occurred as the result of general enfeeblement.

Here, then, is full confirmation and extension of Noguchi and Moore's work. On the basis of their observations, the French workers formulate the etiology and genesis of general paralysis as follows: The disease is the result of the proliferation of the spirochete in the cerebral cortex and of the acute and chronic lesions thus produced. This proliferation occurs in successive crops and in varying localizations, most frequently in the anterior parts of the brain. As the proliferation in one focus ceases, and the parasites die, another may begin in a hitherto intact convolution, thus explaining why a distinct and advanced lesion may not contain large numbers of parasites. Probably the apoplectiform attacks characteristic of general paralysis are connected in some way with proliferative climaxes on the part of the spirochete, particularly when located in motor zones. At any rate the parasite appears to be easy of discovery in the cases in which death occurs in the apoplectiform attack.

General paralysis, then, is the result of actual syphilitic infection of the brain. This knowledge will stimulate the efforts to find some way of arresting this infection, even if it may be impossible to restore the affected parts to their normal state. Efforts will be made also to delve deeper into the nature of locomotor ataxia.

COLD STORAGE AND THE FOOD-SUPPLY

Now that the cold storage business has become a permanent feature of the American food industries, it is a public duty to investigate the varied aspects of this mode of preservation with a view alike of correcting its shortcomings and developing its possibilities. In many quarters the manifold aspects of cold storage and its practical applications to human health and nutrition have not as yet received the serious consideration which the magnitude of the interests involved warrants. Figures sometimes serve as a stimulus for a better appreciation of the facts of commerce and the progress of science. A government report[1] is authority for the statement that the estimated receipts into cold storage during one year amounted in round numbers to 131,000,000 pounds of fresh beef, 20,000,000 pounds of fresh mutton, 176,000,000 pounds of fresh pork, 157,000,000 pounds of butter, and 10,000,000 cases of eggs. It appears that 3.1 per cent. of a year's production of fresh beef, commercial slaughter, goes into cold storage; and the data for the other meats furnish even larger figures. Of the farm and factory production of butter during a year, 9.6 per cent. goes into cold storage, and of the farm and non-farm production of eggs, 15 per cent. The wholesale value of the fresh beef, mutton and pork received into cold storage totaled $35,000,000; of butter, $40,000,000, and of eggs $64,000,000.

Influences of such magnitude bearing directly on so vital a matter as the food factor in national welfare assuredly cannot be overlooked by those interested in the public health. Inasmuch as some of the abuses or objectionable features of cold storage have centered in the unduly prolonged retention of food products, with the consequent possibility of deterioration and incipient decay, instead of perfect preservation, it is interesting to learn in an authentic way something about the actual periods of time during which the food products have in the past actually been subjected to the conservation processes by cold storage in practice. It appears that the receipts into cold storage are entirely or very nearly exhausted by the deliveries within ten months. Very small percentages of some of the commodities were stored for a much longer time, but these are explained by warehouse men as being caused by special circumstances of an uncommercial nature.

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[1] Noguchi and Moore: Jour. Exper. Med., 1913, xvii, 232. Spirochaeta Pallida in the Brain in General Paralysis, editorial. The Journal A. M. A., March 29, 1913, p. 1002.

[2] Noguchi: München. med. Wchnschr., 1913, lx, No. 14.

[3] Levaditi, Marie and Bankowski: Ann. de l'Inst. Pasteur, 1913, xxvii, 577.

[1] Holmes, G. K.: U. S. Dept. Agric., Bur. Statis., Bulls. 93 and 101. See also Exper. Sta. Rec., 1913, xxviii, 868.

The largest "carry-over" into the second year of storage of the six products investigated has been in the case of dressed poultry, that of eggs being decidedly the lowest. For the average length of time in cold storage the actual costs are surprisingly small, being reported as ranging from a fraction of a cent per pound for meats to 3.5 cents per dozen for eggs—figures representing only a small percentage of the wholesale price of the commodities. If the service thus rendered is a wholesome one, its operations involve a reasonably economical expenditure. In so far as cold storage involves merely a readjustment of price levels, its regulation is a matter of public concern; but that is quite aside from the real hygienic problems concerned therein. We quote the conclusion of the government expert: "Let the fact be what it will with regard to the effect of cold storage on prices, the fact remains that cold storage has been of incalculable benefit to consumers in providing commodities for consumption out of the natural productive season."

SPLENECTOMY AND THE METABOLISM OF IRON

Leon Asher of Berne and his collaborators have devoted considerable attention to the relation of the spleen to the metabolism of iron.[1] It appears from their researches that after removal of this organ from the body, iron is no longer retained as effectively as by the intact organism. There is an augmented continued loss of the element with the feces, an observation that has been confirmed in the case of splenectomized man.[2]

One gains the impression from the studies on record that the spleen is in some way concerned with the conservation of iron. This is strengthened by the added fact that young spleenless animals kept on a diet deficient in iron exhibit a far greater diminution of red blood-cells and hemoglobin than do the normal young of the same species. There is no evidence of an undue destruction of blood elements, for a liberal supply of iron is all that is necessary to develop normal blood conditions even in the absence of the spleen.[3]

Dr. Pugliese[4] of Milan has proceeded with the experimental analysis of this peculiar function of the spleen. Interrelations between the liver and spleen have been asserted to exist. The Italian physiologist has therefore investigated the secretion of bile in the same animal before and after splenectomy. The volume of bile secreted after removal of the organ is, if anything, increased; but the output of iron in the fluid is noticeably diminished thereby. This is explicable in the light of the diminished iron content of the liver that may be expected in persons losing undue amounts of iron with the feces. Pugliese has further demonstrated a diminution of the iron in the blood, along with the decrease in erythrocytes and hemoglobin, in the early period after splenectomy. This does not persist very long, however, before a recovery of normal conditions in the blood ensues. The facts confirm what we have earlier pointed out, namely, that with a suitable diet the nutritive outcome of splenectomy need not be in any way unfavorable.

Current Comment

"SCORING" THE MILK SELLER

We recently discussed some of the factors which demand consideration in the present attempts to improve the quality of the milk-supply to cities, and offered some comment on the limitations which affect the producer.[1] A still different aspect of the subject has been raised by the investigator in charge of the market-milk investigations of the Bureau of Animal Industry.[2] He remarks that it has been a too prevalent custom in the past to lay all of the blame for dirty milk on the shoulders of the milk producer. While this may be an easy and convenient way, he adds, to shift the burden of responsibility from city to country, it is apt not only to hurt the dairy industry unfairly, but to close the eyes of reformers and health authorities to questions that lie nearer home. Milk inspection, to be complete, must apply to the places and modes of delivery quite as well as to the farm and its environment.

Precisely as systems of "scoring" dairy farms have been planned and are actually in operation as a basis for selling graded milk, so it is now proposed to devise a scheme of inspection and method of control for the stores and distributing plants concerned in the milk industry. There is the widest variation in the practices now prevalent in our American cities. In some there is rigorous control exercised by efficient health authorities, under whom a "license" or a "permit" carries with it an assurance of reliable supervision. In other places there are dead-letter regulations or no laws whatever. There are communities in which the sale of milk in bulk is forbidden; elsewhere it is freely tolerated.

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[1] Functions of the Spleen, editorial, THE JOURNAL A. M. A., Oct. 26, 1912, p. 1546.

[2] Bayer, R.: Mitt. a. d. Grenzgeb. d. Med. u. Chir., xxi, 338; xxii, 111, 532.

[3] Vogel: Biochem Ztschr., 1912, xliii, 386.

[4] Pugliese, A.: Neuer Beitrag zur Physiologie der Milz; das Eisen der Galle und des Blutes bei entmilzten Tieren, Biochem. Ztschr., 1913, lii, 423.

[1] Financial Factors in the Milk-Supply Problem, editorial, THE JOURNAL A. M. A., Aug. 9, 1913, p. 415.

[2] Kelly, E.: The Control of Bulk Milk in Stores, Twenty-Eighth Annual Rep., Bur. Animal Ind., Washington, 1913, p. 237.

The conditions essential for the preservation and delivery of milk in a sanitary condition are now well known in a professional way. It is perhaps not too early, therefore, to bring pressure to bear at every point at which a violation of the necessary provisions spells failure. To attempt to "standardize" stores handling milk and to rate them in the public eye along the lines which are followed by the inspectors who safeguard the sources of supply of cities like New York, may be premature in 1913. High ideals are worth striving for. It is not difficult to educate an interested public by a system of propaganda. Drastic ordinances cause unnecessary hardships and friction. The fortunate community is one that succeeds in securing cooperation at every step, first by inculcation and then by liberal enforcement of reasonable measures.

MEANING OF THE WORD "CURE"

Recently we commented on the misinformation frequently given the public through the newspapers by the incorrect translation of the word "cure" or *Kur* from medical reports in foreign languages.[1] Another instance of the mistranslation of the word "cure," which in foreign tongues means only care or treatment, is taken from an item in an Italian medical journal on the subject of large medical fees. The item cited refers to the late J. P. Morgan, and a portion of the original item showing the use of the word "cure" may be quoted in the original Italian:

> Le quattrocentomila lire di compenso fissate ai medici che *curarono* Morgan durante l'ultima sua malattia fanno ricordare altri casi di colossali onorari a sanitari illustri.

This is the way it was translated:

> The $80,000 awarded to the physicians who cured J. P. Morgan during his fatal illness brings to mind other large fees paid to illustrious members of the medical profession.

CONSCIENCE AND VACCINATION

To any one to whom figures mean anything or who is willing to accept the *absolutely* undoubted results of experience, vaccination as a preventive of small-pox is an established fact. If the good of the whole people is to be regarded as a principle of disease prevention as it is in other matters of government, then vaccination should be universally compulsory. That it is not so
a reflection on the good sense and good judgme[illegible]ly
enlightened people. We find, however, that in general
well-governed country as Great Britain, w[illegible]ochete was
tion may almost be said to have [illegible] It is of importance
where it was placed on a [illegible] cases death occurred in a
paralytic [illegible]ner, vaccination is [illegible]ack, whereas in the nega-
tive case it anyone who ass[illegible] result of general enfeeble-
ment. to vaccination [illegible]
[illegible]ions of the hea[illegible]

Here, then, [illegible]body from a [illegible]ation and extension of
Noguchi and Moo forth in a re[illegible] the basis of their obser-
vations, the French to a parliam[illegible]ulate the etiology and
Local Gove[illegible]
thanks, p[illegible]
antivacc[illegible]

centage of persons exempted from vaccination on account of conscientious objections as compared with the total number of births from 1907 to 1912 increased from 6.3 per cent. in the former year to 17.3 per cent. in 1908 and thence rapidly to 31.6 per cent. in 1912. The tolerance of a privilege which permits one out of three persons practically to nullify the effect of a proved preventive health measure is an absurdity in this day, and will merely result in a large measure in return to the horrible small-pox conditions of former days in Great Britain. The prevalence of small-pox in the United States during the past year is no doubt due to the absence of strict regulation in regard to vaccination, the lax enforcement of regulations already provided or the total ignoring of these regulations. The matter of vaccination should nowhere depend on any sort of objections of an individual, but should be determined solely by scientific and statistical knowledge.

THE "COLLOIDAL NITROGEN" OF THE URINE

Almost from time immemorial the urine has been called on to bear the burden of many of the uncertainties that are involved in the subtle and ever-changing art of diagnosis. Color and consistency, odor and transparency, have been clothed from time to time with some unique temporary significance that has been dispelled in turn with the progress of investigation. When real knowledge is wanting, the distinction between the initiated and the novice, the bona-fide student and the impostor is not always easily drawn.

It is a common experience to find new "discoveries" invested with some unusual import. We recall the controversy which centered about the alleged finding of "ureine" as a significant constituent of the urine a few years ago. Now this hypothetic substance has completely lost its identity and the name itself is probably unrecognized by the student of to-day.

A few years ago considerable was written regarding
what was called the "colloidal nitrogen" of the [illegible] of
expression was derived from the obs[illegible]nority for the
urine is concentrated the[illegible] receipts into cold storage
a precipitate whic[illegible]unted in round numbers to 131,-
of compoun[illegible] of fresh beef, 20,000,000 pounds of
abl[illegible]mutton, 176,000,000 pounds of fresh pork,
[illegible]7,000,000 pounds of butter, and 10,000,000 cases of
eggs. It appears that 3.1 per cent. of a year's production of fresh beef, commercial slaughter, goes into cold storage; and the data for the other meats furnish even larger figures. Of the farm and factory production of butter during a year, 9.6 per cent. goes into cold storage, and of the farm and non-farm production of eggs, 15 per cent. The wholesale value of the fresh beef, mutton and pork received into cold storage totaled $35,000,000; of butter, $40,000,000, and of eggs $64,000,000.

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2. Noguchi: München. me[illegible] 1913, lx, No. 14.
3. Levaditi, Marie and B[illegible] de l'Inst. Pasteur, 1913, xxvii, 577.
[illegible]ditorial, The

1. Holmes, G. K.: U. S. Dept. Agric., Bur. Statis., Bulls. 93 and 101. See also Exper. Sta. Rec., 1913, xxviii, 868.

THE PATHOGENESIS OF ARTHRITIS

There is food for thought in a paper by Beitzke which reports the results of a study of the joints in two hundred necropsies in the Pathology Institute at Berlin.[1] This work was the continuation of a study carried out in the same laboratory by Rimann which had disclosed that in the bodies of one hundred persons, in age ranging between 15 and 80 years, alterations were visible in the knee-joints of no fewer than sixty-seven. This surprisingly large incidence of joint changes in persons not considered to be arthritics is more than corroborated by Beitzke's investigation. He examined in two hundred bodies not only the knee-joints, but also the joints at the base of the great toes and often the hip-joints and shoulder-joints, finding in this series but thirty-five who did not have lesions in at least one of these joints. Of the total number there were six cases of ordinary arthritis deformans and in sixteen there were some evidences of gout, so that of 178 bodies of persons without these typical joint diseases there were macroscopically visible changes in the joints in at least 143. The lesions varied from areas but a few millimeters in diameter in which the cartilage was thinned and degenerated, up to erosive changes destroying practically all the cartilage, associated with fibrotic alterations in the underlying bone tissue. Essentially there is no difference between these lesions and those of atrophic arthritis deformans, and the conclusion seems warranted that they are the result of the trauma of every-day life from which all persons suffer, and that they constitute a *locus minoris resistentiae* which determines the action of bacterial products, or of the bacteria themselves, in persons suffering from chronic infections. They are present alike in the two sexes, and increase in frequency with age, the figures being 60 per cent. in persons from 20 to 40 years old, 95 per cent. between 40 and 50 years, and practically 100 per cent in older persons. In these findings a ready explanation is seen of the great
frequency of arthritic disease, and it becomes easy to
SPLENECT by an infectious process in the tonsils, the
Leon Asher of Bladder is so likely to cause trouble
devoted considerable attention
spleen to the metabolism of iron.[1] It app
researches that after removal of this organ
body, iron is no longer retained as effectively as by the intact organism. There is an augmented continued loss of the element with the feces, an observation that has been confirmed in the case of splenectomized man.[2]

One gains the impression from the studies on record that the spleen is in some way concerned with the conservation of iron. This is strengthened by the added fact that young spleenless animals kept on a diet deficient in iron exhibit a far greater diminution of red blood-cells and hemoglobin than do the normal young of the same species. There is no evidence of an undue destruction of blood elements, for a liberal supply of iron is all that is necessary to develop normal blood conditions even in the absence of the spleen.[3]

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1. Functions of the Spleen, editorial, THE JOURNAL A. M. A., Oct. 26, 1912, p. 1546.
2. Bayer, R.: Mitt. a. d. Grenzgeb. d. Med. u. Chir., xxi, 338; xxii, 111, 532.
3. Vogel: Biochem Ztschr., 1912, xliii, 386.

nue and Sixteenth Street, Chicago, beginning September 24, at 9:30 a. m. No one will be admitted to the examination unless he presents a card of admission which will be issued to any applicant whose application is received on or before September 16. Application should be made to the Acting Secretary of the State Board of Health, Springfield.

Additions to University Faculty.—The following appointments to the faculty of the University of Illinois were announced by the president, August 26: Dr. Albert C. Eycleshymer, St. Louis, professor of anatomy and head of the department of anatomy of the medical school; Dr. Richard Rupert, Chicago, instructor of anatomy; Dr. George P. Dreyer, Chicago, professor of physiology and head of the department of physiology, school of medicine; Dr. Bernard Fantus, Chicago, professor of pharmacology; Dr. Edgar Grim Miller, Columbia, Pa.; Dr. J. Craig Small, Chambersburg, Pa., and Dr. H. N. Walker, Harrisburg, Pa., assistant professors of physiologic chemistry; Dr. Edgar D. Coolidge, Chicago, professor of materia medica and therapeutics; and Dr. Louis Schultz, Chicago, assistant professor of oral surgery and pathology.

Personal.—Dr. Perry H. Wessels, Jr., has been reappointed city physician of Moline.——Dr. John P. Benson, Joliet, has been appointed physician at the State Penitentiary.——Dr. J. S. Mason has been elected president, Dr. A. Darwin Kirby, vice-president and Dr. W. M. Honn, secretary of the medical staff of the Julia F. Burnham Hospital, Champaign.——Dr. Paul Sherman, Shawneetown, has been appointed inspector of the State Board of Health.——Dr. and Mrs. W. Grant Hatch, Rockford, sailed for Europe, September 3.——Dr. Anna Dwyer, Chicago, has been appointed a member of the State Charities Commission, vice Dr. John T. McAnally, Carbondale, resigned. ——Dr. William Barnes, Decatur, is convalescent after an operation for appendicitis.——James Mullenbach has been appointed superintendent of the Cook County Institutions, Oak Forest.——Dr. George S. Rainey has been elected a member of the Common Council of Salem.——Dr. J. L. Aleshire, Plainville, was operated on for appendicitis August 11, and is doing well.——Dr. G. F. Tyson, Evanston, has started for Europe.——Dr. J. F. McCutchan, Alexis, celebrated his eightieth birthday anniversary, August 9.——Dr. Mathilda Freitag, Savage, was stricken with appendicitis while traveling in Holland, recently, and was operated on, and is reported to be making satisfactory progress toward recovery.

Chicago

Physician Exonerated.—Dr. A. E. Ludwig, charged with having caused the death of Mrs. Marie Lucas through an operation, was exonerated by the coroner's jury, August 14.

Health Commissioner to Handle Garbage Plant.—Dr. George B. Young, commissioner of health, has been placed in charge of the new city garbage reduction plant to be acquired from the Chicago Reduction Company under the ordinance recently passed.

MASSACHUSETTS

Personal.—Dr. Arthur Allison Howard has been appointed physician-in-chief of the Hospital for Children and of the Children's General Outpatient Department of the Boston Dispensary, succeeding Dr. William Palmer Lucas, resigned.—— Dr. John H. Cain has received the appointment of postmaster be Lexington.

for se**Yard Expedition Successful.**—The expedition sent out by
a scheme Medical School for the investigation of tropical dis-
stores and ng of Drs. Ernest E. Tyzzer, Richard P. Strong,
industry. There is the J. Bruce, has returned after a successful
now prevalent in our Am weeks at Guayaquil, Ecuador,
is rigorous control exercis in Peru, where they made espe-
ties, under whom a "licens es.
it an assurance of reliable —Beginning with the fall term,
there are dead-letter regula assachusetts Institute of Tech-
There are communities in s ooperation, a school for public
bulk is forbidden; elsewhe hich is to prepare young men
specially to fit them to occupy
sitions such as those of health
s of health, secretaries, agents
anizations. The requirements for
es of colleges and scientific schools
te instruction in physics, chemistry,
rman may be admitted to the school.
ot the prerequisite for admission. The
which will conduct the new school is
illiam T. Sedgwick, Dr. Milton J. Rose-

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4. Pugliese, A.: Neuer B Eisen der Galle und des Ztschr., 1913, lii, 423.
1. Financial Factors JOURNAL A. M. A., Aug.
2. Kelly, E.: The Eighth Annual Rep., Bu

nau and Prof. George C. Whipple of Harvard. Each student who satisfactorily completes the course in the school will be granted a Certificate of Public Health signed by the presidents of both institutions.

MICHIGAN

New Officers.—Upper Peninsular Medical Society at Ishpeming, August 6-7: president, Dr. H. J. Hornbogen, Marquette; vice-presidents, Drs. George G. Barnett, Ishpeming, and C. F. Moll, Kenton. Houghton was selected as the meeting place for 1914.

State Farm for Epileptics.—The Governor, the Secretary of the State Board of Corrections and Charities and the State Health Officer recently looked over the proposed site for the new epileptic colony near Ann Arbor. The new institution will be on the lines of a colony settlement and segregation will be one of the principle factors.

Personal.—Dr. Angus McLean, Detroit, has returned from Europe.——Dr. W. S. Mackenzie has succeeded Dr. Clifford C. Kirkpatrick as local surgeon for the Wabash System at Adrian.——Dr. R. W. Hodges, Freda, has succeeded Dr. W. D. Whitten as surgeon at the Baltic Mine and Dr. H. D. Cornell, Victoria, has been appointed surgeon at Freda. Dr. Whitten will locate in Southern California.——Dr. R. D. Sleight, Battle Creek, has returned from Europe.

MINNESOTA

Tax Assessed on Physicians.—On the assumption that physicians have money in the form of bonds, stocks and notes, the Ramsey County Board of Equalization has directed the county assessor to assess every physician whose name appears in the city directory, from $500 to $1,000 for moneys and credits.

The Vincent Plan.—President Vincent's plan to readjust the university clinical staff at the city and county hospital, St. Paul, was considered by the Board of Control, August 18. Under the proposed plan, the university staff will concentrate its work in the period of six months and according to the superintendent of the hospital, the plan can be put into operation without making any very radical changes.

Personal.—Dr. L. M. Brunet, Duluth, has resigned as agency physician at Nett Lake and will resume practice in Superior, Wis.——Dr. B. E. Hempstead, Duluth, has started for Europe. ——Dr. William D. Kelly, St. Paul, has succeeded Dr. John T. Rogers as chief of the staff of the city and county hospital and Dr. Frederick E. Leavitt has been elected secretary of the staff——Dr. E. W. Buckley, St. Paul, has been elected supreme physician of the Knights of Columbus.

MISSOURI

Personal.—Dr. J. R. Ernest, Kansas City, Kan., has been appointed surgeon in the United States Coast and Geodetic Survey service.——Dr. George H. Jones, Kansas City, has been appointed State Bacteriologist, vice Dr. M. C. Stone, Jefferson City, resigned.——Dr. R. O. Lieuallan, Mercer, has succeeded Dr. A. H. Vandivert as assistant physician at State Hospital No. 2, St. Joseph.——Dr. E. H. Trowbridge, assistant physician at State Hospital No. 2, St. Joseph, has been appointed assistant superintendent for the Minnesota School for Feeble-Minded and Colony for Epileptics at Faribault.——Dr. J. F. Binnie, senior attending surgeon to the Kansas City General Hospital, has resigned.

St. Louis

Sanatorium Fund Nearly Ready.—There is only needed $2,872 to complete the $50,000 fund necessary to secure for the Missouri Baptist Sanatorium, the subscription of $100,000 made by the late A. D. Brown.

Leper Escapes.—George A. Hartman, who was examined and pronounced a leper several weeks ago and was assigned to the Carter Camp 14 miles south of St. Louis, escaped for the second time in three weeks, August 27.

Hospital Library Plan.—The City Hospital Board has taken up the matter of installing a medical library at the city hospital for the benefit of its interns. A part of a fund of $500 is said to be available for this purpose, and contributions of books have been offered by members of the staff and others.

NEBRASKA

Hospital Notes.—Germans of Omaha propose to build a new hospital and deaconess home in that city. The hospital work will be in charge of the German Samaritan Hospital Association, an interdenominational organization which includes all the German churches in the city.——Ground was broken recently at Hastings for the Mary Lanning Hospital which is to be erected by W. H. Lanning in memory of his daughter. ——Although the last legislature appropriated funds for a new building at the Norfolk State Hospital to relieve the present crowded conditions, no action has yet been taken by the Board of Control.

Personal.—Dr. W. D. Guttery, Pilger, has been appointed superintendent of the State Hospital for the Insane, Norfolk. ——Dr. E. M. Whitten, Nebraska City, is reported to be seriously ill.——Dr. Amy R. Robinson, Hastings, who has been seriously ill with ptomaine poisoning, is said to be convalescent.——Dr. R. L. Ivins, Harrison, has returned from Omaha, convalescent, after an operation for the removal of the appendix.——Dr. H. R. Carson has been appointed first assistant physician at the State Hospital, Norfolk, and Dr. R. H. Foster, Omaha, has been made second assistant physician.——Dr. Nellie G. Carr, Deffenbaugh, Grand Island, has been appointed superintendent of the State Tuberculosis Hospital, Kearney. ——Dr. LeRoy Crummer, Omaha, has returned from Europe. ——Dr. W. H. Wilson, Table Rock, has been reappointed state health inspector.——Dr. Elmer R. Porter, Omaha, has recovered $1,190 for medical services rendered the late Anna Williams. His original claim was for $5,000.

NEW YORK

New York City

Another Decrease in Infant Death Rate.—The figures for the infant mortality for the week ending August 23, showed a decrease from the number of deaths reported for the corresponding week of 1912. There were only 340 deaths as compared with 350 for the corresponding week of last year. The reductions were in Brooklyn and the Bronx.

Atmospheric Conditions in City Schools.—The report of the Committee on School Inquiry of the Board of Estimate and Apportionment has been submitted by Prof. Charles Baskerville and Prof. C. E. A. Winslow who worked with Prof. Paul H. Hanus of Harvard in making the investigation. Some of the conclusions reached were that some of the best and some of the worst ventilated schools were fan-ventilated and that the whole problem rested on the skill with which the fan system was operated. It was found that the air in the schoolrooms investigated was good in so far as dust was concerned, the number of bacteria, moulds and microbes being small. In regard to temperature it was found that out of 1,800 determinations only 14 per cent. were over 71 degrees F., indicating that overheating is rare. In about one-sixth of the schoolrooms investigated the conditions were distinctly bad, but this was due to the carelessness of janitors and the interference of teachers rather than to construction. It was found that air conditions in the night-schools were not as good as in the day-schools, owing to the fact that the ventilating systems frequently are not operated at night.

Court Upholds Oral Agreement.—In January last Dr. James P. Tuttle, since deceased, operated on James R. Keene, the latter dying the same day. Dr. Tuttle then presented a bill to the estate for $5,200, which he said was in accord with an oral agreement with the patient. The executors of the Keene estate claimed that the bill was excessive, but permission has been granted by the court to settle with Dr. Tuttle's estate for $4,000.

Personal.—Dr. Louise Pearce of the Johns Hopkins Hospital has been appointed as assistant to Dr. Simon Flexner at the Rockefeller Institute for Medical Research.——Dr. and Mrs. Theodore C. Janeway, Dr. William L. Culbert and Dr. Howard Fox, have recently returned from Europe.——Dr. Lester M. Hubby and Dr. Emil Frei of Brooklyn have sailed for Europe.

NORTH CAROLINA

Physician Acquitted.—Dr. E. A. Hennessee, Glen Alpine, who killed a man in a street duel a few months ago, was tried last week and acquitted. Dr. Hennessee himself sustained several injuries including a penetrating gunshot wound of the lung.

Personal.—Dr. Platt W. Covington, formerly of Wadesboro, who has been doing acceptable work in the hookworm department of the State Board of Health for two years past has been placed in charge of the newly created Board of County Health with headquarters in the department of Public Health, Raleigh. The aim of this department is to care for and develop interest in county health work throughout the state and especially to facilitate health work in those counties where a whole-time health officer is in charge.——Dr. S. Westray Battle, Asheville, has sailed for Europe.

OHIO

New Hospital for Port Clinton.—Dr. Henry J. Pool has purchased the Carrothers residence on East Second Street, Port Clinton, and has converted it into a private hospital.

Physicians Named for Poor.—Safety Director Mooney, Toledo, has announced the appointment of the following twelve physicians to render aid to the indigent poor: Drs. Geo. L. Chapman, Helen M. Nolen, W. E. R. Schottstaedt, James G. Cullen, Dalton Kahn, Leo S. Talaska, James C. Price, Emily C. Willoughby, Edwin C. Ballinger, Robert E. Lawless, Frank C. Titus, and Charles H. Ferguson.

Personal.—Dr. H. L. Sanford, Cleveland, has been appointed member of the Board of Health vice Dr. J. E. F. Cogan, retired.——Dr. Wm. L. Neville, Lima, has been appointed a trustee of the Lima Hospital, succeeding Dr. F. M. Hassey, Sidney, who was recently appointed superintendent of the institution.——Dr. Wm. R. Dabney, Marietta, is said to have become demented while performing an operation in Dayton, October 12, and to have been committed to Longview Asylum, Cincinnati.——Dr. and Mrs. Tenney, Toledo, have sailed for Europe.——Dr. Charles S. Means, Columbus, is reported to be ill with typhoid fever.

PENNSYLVANIA

Campaign Against Quacks.—The York County Medical Society has started a campaign against quacks, a committee on illegal practice having been appointed with instructions to proceed with prosecutions against alleged offenders.

Typhoid Fever in the State.—Typhoid fever has again appeared at Royersford, seven cases having been reported within the past week. Many cases of typhoid have been reported throughout the outlying districts of Winslow.

Personal.—Dr. John W. Phillips, Troy, has sailed for Europe.——Dr. J. T. Eckert, Allentown, suffered a fracture of both clavicles by the overturning of his automobile, recently.——Dr. John A. McKenna and family, Landsdowne, sailed for Europe, August 9.——Dr. and Mrs. Charles S. Rebuck and son, Harrisburg, have returned from Europe.

Hospital News.—The bids for the erection of the new Hospital for the Insane of Westmoreland County were opened August 12. The lowest bid was $331,200.——The bids received for the construction of St. Mary's Hospital, South Scranton, were all above the figure which the hospital could afford to pay, and further progress in the matter has been deferred indefinitely.

Philadelphia

Increase in Typhoid.—Seventy-four new cases of typhoid with ten deaths were reported to the Bureau of Health for the week ended August 30, an increase of 25 over the preceding week.

Baby Saving Show at Public Disposal.—After October 1, the Baby Saving Show will be removed from its present quarters in the City Hall and placed at the disposal of the public. In order to place the exhibit before the parents of the city, the Child Hygiene Association has asked that applications for the show in different neighborhoods be sent in as soon as possible.

Little Mothers' Clinics.—The success of the Little Mothers' Clinics held at the mission house at Tenth and Kimball Streets, proved by the attendance of more than fifty little Italian girls carrying their small charges at the third clinic and their interest in the instruction given. The ages of the children ranged from 5 to 8 and they were in charge of Dr. Mary Fallon.

Public Works Department to Ask City to Build Garbage Plant.—At the next meeting of the City Council, Director Cooke of the Department of Public Works, will submit plans and estimates for a city garbage plant. The complete proposition includes: Construction of municipal garbage reduction plant with collecting equipment to cost approximately $1,000,000. Abolition of pigs and piggeries within the city limits. Use of closed metal garbage cans by every householder in the city. Since 1905, the city has spent nearly $4,000,000 for the collection and disposal of its garbage and there have been complaints and protests from all parts of the city of the lax and irregular collections.

Personal.—Dr. George P. Mueller has been elected professor of surgery in the Philadelphia Polyclinic, succeeding Dr. Lewis W. Steinbach, deceased.——Dr. Mary W. Griscom sailed for Europe, September 2, en route to Korea by way of Siberia.——Dr. J. William White sailed for Europe August 16 and will be abroad for eight months, returning by way of China.——Dr. William Gautner of the Philadelphia Hospital for the Insane, has been appointed assistant physician at the new State Hospital, Pottsville.——Dr. George C. Signor has been elected superintendent of the Eastern Pennsylvania Institution for the feeble-minded and epileptics, near Spring City, vice Dr. H. M. Carey, resigned.——Dr. Henry F. Page, medical superintendent of the German Hospital, was seriously injured by being thrown from a carriage in a runaway near Bangor, Me.——Dr. Eric S. Wischeart, for two years senior house physician at the Presbyterian Hospital, has resigned to enter practice in Snow Hill, Md.

WASHINGTON

Harvard Professor in Seattle.—Dr. Joel E. Goldthwait, Boston, a member of the faculty of the Harvard Medical School, was the guest of the King County Medical Society, Seattle, at luncheon, August 12, and addressed the organization on the subject of "Visceral Ptosis."

Personal.—Dr. W. E. Cass, Vancouver, has been appointed superintendent of the Northern Hospital for the Insane, Cedro-Woolley.——Dr. E. W. Fell, Medical Lake, has been appointed assistant physician of the Elgin (Ill.) State Hospital.——Among those in attendance at the seventh annual pilgrimage of the mountaineers in the Olympian mountains, were: Drs. F. W. Griener, Ballard, and N. P. Wood, Seattle.

WISCONSIN

Will Select Site for Camp.—The State Forester and Dr. J. W. Coon of the State Tuberculosis Sanatorium, Wales, have been authorized by the State Board of Control to select a site in the Forestry Reserve for an experimental tuberculosis camp.

Tuberculosis Notes.—The revised plans for the proposed municipal hospital at Waukesha call for an expenditure of about $12,000. The institution will accommodate from fourteen to sixteen patients.——Drs. D. R. Connell and H. C. Maurer, Beloit, have purchased the old St. Mary's Hospital building in that city and will, it is expected, open a hospital in the near future.——At the semi-centennial celebration of the Milwaukee Hospital, it was announced that a gift of $100,000 had been made to the institution by Mr. Frederick Layton.

Personal.—Dr. Edward Kremers, Madison, had conferred on him the honorary degree of D.Sc. by the University of Michigan, Ann Arbor, recently.——Dr. Frank I. Drake, Madison, has been elected physician of the State Penitentiary, Waupun, vice L. Rock Sleyster, who has been made superintendent of the State Hospital for the Criminal Insane.——Dr. H. A. Norden has resigned as health officer of Sturgeon Bay, to accept the position of superintendent of the Chicago-Winfield Tuberculosis Sanatorium, near Chicago.——Dr. Belle P. Nair, Fort Atkinson, has been appointed resident woman's physician at the Northern Hospital for the Insane, Oshkosh.——Dr. Leopold Schumacher, first assistant on the medical staff of the University of Wisconsin, in charge of students' health, has resigned and will practice in Chattanooga, Tenn.

GENERAL

Tuberculosis Sunday.—The National Association for the Study and Prevention of Tuberculosis announces that Sunday, December 7, has been designated as the fourth annual tuberculosis day at which special efforts will be made through churches and otherwise to interest the people in this most important subject.

Bequests and Donations.—The following bequests and Donations have recently been announced:

Industrial School for Crippled and Deformed Children, Boston, $30,000. Children's Hospital, Boston, $10,000. Boston Home for Incurables, Boston Dispensary, Boston Nursery for Blind Babies and the District Nurses' Association, each $5,000 by the will of Amos Cotting, Boston.

Pottsville (Pa.) Hospital, $30,000 by the will of Mrs. James Muir.

Chautauqua County Tuberculosis Hospital, $150,000 by the will of Mrs. Elizabeth M. Newton, Fredonia, who died recently in California.

Gorgas to Go to Africa.—In despatches from Johannesburg, South Africa, under date of August 14, it is stated that Colonel William C. Gorgas has received an invitation from the Chamber of Mines, Johannesburg, to visit South Africa, study the sanitary conditions in the Witwatersrand mines and to make suggestions as to their improvement. The special object of the conference is the prevention of epidemic pneumonia of a very fatal type among the blacks such as occurred several years ago among the negro laborers at Panama and was successfully handled by improvement of the sanitary conditions. Colonel Gorgas has accepted the invitation subject to the approval of the United States Government, and has applied for leave of absence of four months to enable him to make the journey and complete the research required.

Library of Radiographs.—An attempt is being made to establish, at the Army Medical Museum, Washington, D. C., an extensive library of lantern and stereoscopic slides of radiographs, representing the work of radiographers who have done particularly notable work along certain lines. Enough slides have already been received to make the collection of value for reference and for teaching purposes at the Army Medical School. Those who have already contributed to the collections are Dr. Lewis Gregory Cole, New York City, slides of stomach, lung and kidneys; Dr. William H. Dieffenbach, New York City, slides of diseases of bones; Dr. Kennon Dunham, Cincinnati, Ohio, stereoscopic slides of the lungs; Dr. Walter C. Hill, Cleveland, Ohio, slides of diseases of bone; and Dr. James T. Case, Battle Creek, Mich., slides of the alimentary tract. Others have promised to send slides, and it is the intention to add to the collection from time to time as important work is done. The collection is available for study by any civilian practitioner on application to the curator, Army Medical Museum, Washington, D. C.

Would Transform Battle Ships into Sanatoriums.—At the closing session of the Fourth International Congress of School Hygiene in Buffalo, August 29, the following resolutions were offered by Dr. S. Adolphus Knopf, New York City, and were adopted without discussion:

> WHEREAS, Nearly a million tuberculous children or children simply predisposed to tuberculosis are attending our public schools, and there is hardly accommodation for 1,500 to receive instruction in the open air; and
>
> WHEREAS, The Congress is convinced that the open air school is one of the most powerful agents in the prevention and cure of tuberculosis in childhood, and it has been furthermore demonstrated that nearly all climatic conditions, providing the air is dust-free, lend themselves to the prevention of tuberculosis in the predisposed and the cure of the afflicted; and
>
> WHEREAS, Statistics show that there are not nearly enough hospital and sanatorium accommodations for adults and children afflicted with pulmonary tuberculosis or children suffering with tuberculous joint or bone diseases; and
>
> WHEREAS, It has been demonstrated in New York and other cities that discarded vessels lend themselves admirably to transformation into all-year-around hospitals and sanatoria for consumptive adults, sanatoria for children afflicted with joint and other types of tuberculosis, and into open air schools for tuberculous, anemic, and nervous childrden;
>
> *Resolved,* That the Fourth International Congress on School Hygiene petitions the United States government to place at the disposal of the various States of the Union as many of the discarded battleships and cruisers as possible to be anchored according to their size in rivers or at the seashore and to be utilized by the respective communities for open air schools, preventoria, sanatorium schools for children, or hospital-sanatoria for adults. Be it further further
>
> *Resolved,* That the Congress expresses its appreciation to the Italian government of the example it has given by consecrating three of its discarded men of war to the combat of tuberculosis. Be it further
>
> *Resolved,* That this Congress expresses the sincere wish that other governments may fellow the example of Italy; and be it finally
>
> *Resolved,* That copies of these resolutions be presented to the American and other governments represented at this Congress.

PARIS LETTER

(From Our Regular Correspondent)

PARIS, August 15, 1913.

Personal

Dr. Lacassagne, professor of legal medicine at the Faculté de médecine de Lyon, who is well-known as the founder and director of the *Archives d'anthropologie criminelle,* has just retired. His place is taken by one of his pupils, agrégé E. M. Martin.

The death of Dr. Bourget, professor of clinical medicine and internal pathology at the Faculté de médecine de Lausanne, is reported.

Irradiated Vaccines

At one of the last sessions of the Académie des Sciences, Dr. Maurice Renaud read an interesting paper on the irradiation of bacteria and irradiated vaccines. He found that bacteria exposed to the radiation from a quartz lamp with mercury vapor are deprived of all their biologic properties while they keep their histochemical properties, and in particular their toxicity. If in man or in animals irradiated cultures of pathogenic microbes are injected, no infectious disease results. Moreover, the inflammatory phenomena at the point of injection are usually insignificant, and the bacteria disappear from the tissues with remarkable rapidity. This resorption creates a condition of intoxication which leads to immunization with appearance of antibodies in the body fluids. Because of these properties of irradiated bacteria it occurred to Renaud to utilize them as vaccines. For two years he has used them for preventive and therapeutic immunization in men, and they have given him, especially in the cases of the staphylococci, streptococci, gonococci, etc., results much superior to those of vaccines obtained by the coagulating action of heat or of chemicals.

Measures against Typhoid Fever

The minister of the interior has just sent to the prefects a circular inviting them to make public in their departments the advantages of the two antityphoid vaccines which have been authorized by a recent decree and which are prepared respectively in the laboratory of Professor Chantemesse at the Faculté de médecine at Paris and in the laboratory of antityphoid vaccination of the Ecole d'application de médecine et de pharmacie militaires at Val-de-Grace. When cases of typhoid fevr which seem likely to give rise to an epidemic occur, the various health officials and the mayors are to place at the disposal of physicians the necessary supply of either vaccine. The minister of the interior, moreover, recommends to the prefects to have the water supply improved hereafter if necessary.

Protection of Women Before and After Childbirth

A woman employed by a merchant brought suit against her employer for $40 (200 francs) for not having given her back the position which she held before the birth of a child. The employer maintained that he owed his former employee at most only a week's wages in lieu of notice. The court, however, held that under the law of November 27, 1909, the woman was entitled not only to the ordinary indemnity for dismissal but also for damages.

Examinations for the Doctor's Degree

Up to the present a medical student who has failed in an examination may present himself for the same examination at the end of three months. A recent decree provides that after four failures on the same examination the candidate may not try again for two years.

BERLIN LETTER

(From Our Regular Correspondent)

BERLIN, Aug. 22, 1913.

Personal

Honorary Professor Goldmann, head surgeon at the Deaconess House in Freiburg, died, August 11, aged 51. Goldmann, who was for many years assistant to Professor Kraske, was a capable investigator who had particularly of late years received general recognition for his researches on vital staining.

Professor Bardenheuer of Cologne died, August 13, at the age of 72. He was one of the most noted surgeons of Germany. His scientific labors were performed especially in the field of fractures and dislocations. His method of treatment by permanent extension has become general. He has also published important contributions in many other fields of surgery. In "Deutsche Chirurgie" he wrote the section on injuries of the extremities. In 1889 he published a manual on the treatment of fractures and dislocations by means of extension (Leitfaden der Behandlung der Frakturen und Luxationen mittels der Extensionsbehandlung).

The Future of the Berlin Krankenkassen

The new imperial insurance law to which I have repeatedly referred requires one general local Krankenkasse in every city so that marked changes must be made in the organization by Jan. 1, 1914, when the new law goes into effect. Many of the other kinds of insurance organizations such as the trade societies, the Innungskrankenkassen, the free aid societies, will be absorbed by the future consolidated local societies.

At present there are in Berlin 54 local societies with about 600,000 members, 69 trade societies with about 165,000 members, 19 Innungskrankenkassen with about 60,000 members and 20 free aid societies with about 35,000 members. According to the new arrangements the membership of the consolidated local society will increase from about 90,000 to about 400,000 and probably will exceed a half million. It is clear that with these extensive changes the relations of physicians will also be disturbed.

As a number of Krankenkassen with free choice of physician are to be dissolved, the number of physicians engaged in insurance work will be materially diminished. On the other hand there will be an increase in the extent of the limited free choice of physician, by which under certain conditions a fixed number of physicians do the work of the societies among whom the insured have free choice. The mass of the insured laborers will secure an advantage from the new organization because, on account of the increased membership of the single societies, these may extend their operations and because there will be less frequent changes of membership in the societies on account of change of occupation, changes which naturally occur much more easily with a smaller membership. At present negotiations are under way between the representatives of the insurance physicians and of the Krankenkassen to secure an agreement on a satisfactory basis between the various interests.

Further Reduction of the Prussian Birth-Rate

The latest statistics show a decline of the birth-rate, the births being 3,156 less than the previous year, a reduction of 1.1 per cent. A reduction in the excess of births over deaths is averted by the fact that the exceptional mortality of 1911 was not repeated in 1912. An increase in the number of marriages is also to be noted.

Increase in Cancer

Recent statistics show a constantly increasing proportion of deaths from cancer, the mortality in 1911 being nearly five thousand more than in 1907. More men than women and more married than single fall victims to the disease. The increase with advancing age is marked. The increase in the mortality per ten thousand is as follows: 1907, 6.57; 1908, 6.60; 1910, 7.04, and 1911, 7.28. The proportion among men rose from 6.03 in 1907 to 6.64 in 1911, and among women from 6.57 to 7.28. Among the unmarried in 1911 there were only 1.09 deaths from cancer per ten thousand living, while among the married the figure was 12.29; among the divorced, 24.09, and among the widowed, 41.79.

Mental Diseases and Occupation

The National Statistical Bureau at Karlsruhe has caused a statistical investigation to be made with reference to the occupations followed by the persons who were admitted to the national sanatoriums and asylums of the grand duchy of Baden during the seven-year period from 1904 to 1910. These statistics include 15,980 insane persons above 16 years of age, of whom 8,678 (54.3 per cent.) were male and 7,302 (45.7 per cent.) were female.

The principal result is a confirmation of the prevailing view that persons engaged in intellectual occupations are chiefly exposed to the danger of mental disease. Of the 15,980 patients, 3,278 belonged to agricultural and forestry employments (1,867 males and 1,411 females); 6,159 persons were employed in trades (3,997 males and 2,162 females); 2,404 in commerce (1,485 males and 919 females); 1,351 (683 males and 668 females) in the so-called free professions (clerks, officials, artists, etc.).

For every thousand persons belonging to a particular employment, there were in June, 1907, 7.8 *insane* (9.4 males and 6.3 females) in agriculture and forestry; in trades 12.1 (13.9 males and 10.2 females); in commerce 14.7 (18.5 males and 11.0 females), and in the free *professions* 16.5 (13.3 males and 19.6 females).

From these relative figures it is plain that of all professions, those engaged in agriculture *and forestry* are least in danger of mental disease. The most liable to mental disease are those belonging to the so-called free professions. Men in all departments of industry are *more* exposed to mental disease than women, with the exception of the free professions, in which the proportion of the female sex (19.6) is far in excess.

If household servants are excluded, the following picture presents itself: 7.4 out of every thousand of those actually engaged as *independent workers* in the agricultural and forestry profession, 13.1 per thousand of those engaged in trades, 19.2 of those engaged in commerce, and 22.5 of those in the professions are subject to *mental* disease.

The danger of mental disease is much less for those who are subordinate workers in each occupation: In agriculture, 5 per thousand; in *the trades*, 12.9 per thousand; in commerce, 12 and in the free professions only 10.3 per thousand of the employees were subject to mental disease, with males predominating.

There were admitted to the sanatoriums in the period from 1904 to 1910 on account of alcoholic insanity or of chronic alcoholism, a total of 1,030 men (1.6 per cent.), and 89 women (0.1 per cent.); on account of paralysis, 748 men (1.1 per cent.) and 216 women (0.3 per cent.); on account of neurasthenia, 324 men (0.5 per cent.) and 43 women (0.1 per cent.); on account of epilepsy 681 men (1 per cent.) and 191 women (0.3 per cent.). This finding corresponds to the well-known fact that the male sex is exposed to a much greater extent than the female to the danger of alcoholic excess and the results of venereal infection (progressive paralysis) and the danger of over-exertion in mental work and neurasthenia.

The *number of independent* male workers affected with alcoholism increases to 6.1 per cent. in the commercial class in which the inn-keepers and saloon-keepers are included; 23 men, including 13 physicians, were admitted to these institutions on account of addiction to morphin or similar narcotic poisons. Paralysis and neurasthenia are prominent, totaling 3.3 or 1.3 per thousand of those engaged among government employees, professional persons and artists and particularly among those who are independent workers.

Among the women admitted, simple mental disturbance was the *most prominent* (6,003 cases, or 9 per cent.). This is explained by the well-known greater tendency of the female sex to emotional disease (melancholic depression, maniacal excitement, etc.), as well as to hysteric affections. Among simple mental disturbances are reckoned also the mental affections which occur in connection with reproduction (pregnancy, labor and the puerperism).

Organization of School Physicians in Würtemberg

The institution of school physicians has been extended throughout Würtemberg by a new law. The superior medical officer (*Oberamtsarzt*) is to be court physician, vaccinator and school physician. He will be charged with the care of the health of the pupils as a principal part of his duties. The school physician must at least once a year visit every school during the instruction period alternately in the summer and winter sessions. He must report on the grounds and the plan for new buildings and for changes in school buildings, as well as the oversight and use of these buildings and their apparatus with reference to their sanitary conditions, attend to the position of the school desks and arrange for seating the pupils according to height and capacity for hearing and seeing, as well as for the position of the body, and supervise the cleanliness of the pupils, carry out sanitary requirements in the instruction, secure a hygienic arrangement of the course of study and test the character of the materials for instruction as well. During the first year he must examine all newcomers and record his findings on a health card supplied for each child. The card contains a personal record of the child and questions to the parents with regard to previous illness. The health cards have a uniform form for the entire country.

The examination of pupils includes the general physical condition, the nervous system, the condition of the ears, eyes, nose and mouth, the chest and its contents, the skeleton, especially the vertebrae, and the limbs. Examinations which require the removal of clothing may not be undertaken in the case of girls, if any objection is raised by those responsible for their education. In any case, a female teacher must be present at such examinations. The examination may be omitted if a card properly filled by a licensed physician is presented at the right time. A similar examination must take place in the fourth and seventh or eighth school years, and also in all schools for boys before the final examination. In the later examinations, the extent of development of the body during the school period must be determined. Suitable advice as to the choice of trade must be attached to the certificates of all children dismissed from school who do not seem entirely healthy. Pupils with pathologic changes must be examined oftener. The parents must be given a statement of the findings. Treatment is not afforded, but in case the pupil is needy, report is made to the authorities. The health cards are kept until the twenty-fourth year. In the schools for technical training there is no supervision by a medical school inspector as a rule. In the normal schools, kindergartens, etc., only an inspection of the schoolrooms and the pupils, without a thorough personal examination.

In Würtemberg there are sixty-four superior districts with about 350,000 children who would be examined by the school physician. The Würtemberg government contemplates in time making the superior medical officers full-time officers and for this purpose to put two superior districts into one. Then each school physician would have about 11,000 children to examine.

Disinfection of Railway Cars

In Potsdam there is an installation for the disinfection of railway cars which so far as I know has not its equal anywhere else. A second institution of the kind is being built at Frankfort-on-the-Main. The principal feature of the entire arrangement is an iron tunnel more than 23 meters (70 feet) long and 5 meters (16 feet) in diameter. It is reenforced with fourteen rings about 6 feet apart. Two iron doors close the tunnel, one of which is fast and the other movable. The front movable door easily slides aside and then the car which is to be cleansed is run on rails into the tunnel. Board runways on the sides of the iron walls enable the workmen to gain access to the car in order to make the necessary preparations. Tubes of various kinds open into the interior. One serves to introduce steam, and another removes air by suction. In addition there are wires for the conduction of electricity.

When the car is properly prepared, the tunnel is closed up air-tight. One man can regulate the iron door with ease. The apparatus is soon made air-tight. In the nearby power-house the pumps begin to work and draw out the air in the apparatus. When a vacuum has been produced the pressure on the door is 4,142,000 kg. At the same time the warming of the apparatus to from 50 to 60 C. (from 122 to 140 F.) is shown by the thermometer and barometer, which are introduced into the interior and which show their condition by electric indicators in the power-house. The machinist knows at every moment exactly what the temperature and pressure are in the interior of the disinfecting apparatus.

The car stands for fully five hours in the air-exhausted apparatus, which has a weight of 135,000 kg.

Heat and steam are not the only means employed. By a special process vapors of formaldehyd are generated in the interior of the car to be disinfected. So thorough are these vapors of formaldehyd that they correspond to the most exacting requirements of the imperial health office. Bacteria very tenacious of life enclosed in tubes and sunk deep into the upholstering are completely devitalized.

Two cars at a time can be thoroughly cleansed and disinfected in this apparatus. Care is taken that the foul air probably contaminated with bacteria does not reach the free air. It has to pass through a furnace where it is burned. From all parts of the empire cars are brought to Potsdam in order that they may be restored to service after a most thorough cleansing. Such a cleansing costs only $5 (20 marks), whereas formerly $50 (200 marks) were required. The Postdam installation cost about $20,000 (80,000 marks).

VIENNA LETTER

(From Our Regular Correspondent)

Vienna, August 15, 1913.

The Report of the Lupus Institute in Vienna

The ravages of lupus have for a considerable time caused appreciable damage to national welfare, so that the action of Professor Lang in establishing a special lupus clinic met a need which was universally felt. This pioneer of surgical treatment of lupus had the satisfaction of witnessing the excellent work done by this, his foundation, as published in the yearly reports of the institute. It has been in existence only three years, and yet 2,061 patients have been treated, as Director Jungmann states in the report for 1912. This figure includes about 15 per cent. coming from Australia, India, Egypt and the United States, for the reputation of the institute is already wide-spread. Of the patients applying for help 561 were treated by excision and cured permanently. The other chief factors of treatment were the Finsen light and the Roentgen rays. The institute has given to 605 patients Finsen treatment consisting of 211,622 single sittings. The trouble and time, apart from the expense, involved by this method is very large, and therefore the treatment by Roentgen rays is preferred in suitable cases because it acts quicker and necessitates less expenditure. Within the last few months the effects of radium were tried with excellent results. It is necessary to subject the diseased parts to prolonged exposures to the active rays, but then it is the best method of actinic treatment. Altogether, 610 patients received 11,764 treatments of radium, and 935 persons 8,060 Roentgen-rays treatments. As yet surgical treatment, in suitable cases, is still the best method for a complete and rapid cure. The institute is owned by the state, and this explains the difficulties encountered at the beginning of its existence.

The Number of Students of the Austrian Universities in the Summer Term, 1913

The last (summer) term of the school year 1912-1913 has again brought an increase in the numbers of students attending the lectures of the universities. Altogether 27,299 students matriculated, which is an increase of 2.8 per cent. over the corresponding period last year. The increase in 1912 over 1911 had been 5 per cent. In the year 1913, 8.2 per cent. of the total number of matriculated students were women, their number having grown 5.5 per cent. Of the sum total, 21 per cent were medical students, among them 410 women. It is interesting to note that the proportion of medical students among women is about equal to the figures for men—20 per cent. As regards the promotion or graduation of students in the last year (1912-1913), 300 candidates received their diplomas of M.D., among them sixteen women, as compared with 2,571 (ten women) in the previous year. For comparison it may be stated that the number of candidates graduating as doctors of the law was 457 in 1911-1912, while this year it was only 381. Of the medical students, 3,780 were German speaking and 2,000 belonged to other (mostly Slavic) nationalities. The religious relations are also interesting. While the Jews form only a small proportion of the entire population of this country (about 4 per cent.), they claim no less than 25 per cent. of the total number of students, especially in medicine and jurisprudence. This indicates that their desire for higher intellectual development is at least six times as great as that of the bulk of the population. It explains also why in various parts of the country the so-called "intellectual proletarians" are so evident. Hitherto, all the warnings against the overcrowding in this profession have been fruitless, and the constant influx of students to the medical career tends to produce really a crisis. The only reason that it has not yet arrived is found in the fact that in the last few years the financial footing of those young men who take up our art for their study seems to be better than in previous years. Medicine is no longer the goal of the penniless youth who thought he could make a living at the very outset of his work.

The Leading Points in the New "Epidemic Act"

A few months ago the new bill called an "Act for Prevention and Fighting of Communicable Diseases" passed both houses of our legislature and therefore is now a promulgated law. All medical men in the empire have now received instructions regarding this law in the shape of a leaflet which contained the following interesting items: "Notice of disease must be made in case of scarlet fever, diphtheria, abdominal typhus, dysentery, epidemic meningitis, puerperal sepsis, exanthematic typhus, small-pox, cholera, plague, relapsing fever, lepra, trachoma, yellow fever, anthrax, malleus and rabies, including injuries by animals suspected of being infected by rabies." (It is interesting that measles, chicken-pox and whooping-cough are not in the list. The reason given for it, that the danger of contagiousness is slight in such cases and that prevention is hardly possible, is not shared by a good many practitioners.) "Each case of disease mentioned before and each death from such as well as every case suspected of belonging to one of these diseases as well as every suspicious death must be notified to the head of the local administrative body. Only puerperal sepsis need not be notified before a definite diagnosis is arrived at. The notification must be made by the medical attendant or the head of the respective hospital or the midwife, the nurse, the head of a school, the innkeeper and, in case of anthrax, malleus and rabies, also the veterinary surgeons, if they learn from their occupation that a person has fallen ill or is suspected of being infected, suspicious objects and localities or those proved of being infectious must be disinfected, and can be destroyed if the disinfection is more expensive than their present value. The local board of health must be notified when the disinfection is completed. Damages sustained by the owners of such disinfected or destroyed objects will be paid for by the state. If persons are kept away from earning their living by being detained or quarantined, they will obtain compensation from the state. Only such persons are entitled to this compensation who are not bound to pay an income tax. The violation of the new law will be punished either by a fine of $20 (100 kronen) or from one to eight days prison. Officers of the board of public health are entitled to examine the patient or the dead body in order to ascertain the disease or the cause of death. The medical attendant must be consulted by them also. If there is a suspicion that an infectious case is kept secret, the help of the police may be obtained by the board of health." It was not possible to obtain from parliament payment of fees for such notifications for the practitioners; but the government will pay $10,000 (50.000 kronen) a year to the medical societies for orphans and widows of practitioners in recognition of the services rendered by the profession to the state.

Organization of Deaf-Mutes in Austria

Last week the tenth meeting of the Austria Union of Deaf-Mutes took place here and some important decisions have been arrived at. An association comprising all deaf-mutes of this empire was founded and the following resolutions will be brought into force by it: first of all, a sufficient number of schools for deaf-mute children shall be erected, so that all such children who are capable of learning will find opportunities for mental development. At present, no more than from about 30 to 40 per cent. of such defective individuals can be cared for in our schools. It was decided that the time of teaching should be extended to eight years instead of the present four to six years, and that the instruction should approach in its aims very near the mark required for normal children. Defectives who are not fit for schools shall be looked after in special institutions, and homes for old or invalidated deaf-mutes who have no one to care for them will also be established. Two important and interesting points of the transactions were the adoption of a uniform "finger-language" (French method) for Austria, and the compilation of a "register" comprising all deaf-mutes in this country. The uniform "language" is most necessary in our empire since there are no less than eight different nations united for mutual help; for this purpose, cooperation with the teachers of the existing deaf-mute schools will have to be effected, for in Austria the German or "oral" method of teaching is prevalent. The necessity of a register is evident for statistical and biologic reasons, and will be also of a high scientific value.

Marriages

W. H. Hombach, M.D., Omaha, Neb, to Miss Margaret Lenora Pierce of Council Bluffs, Ia., in Colorado Springs, August 7.

Ralph C. Tilley, M.D., Petersburg, Ky., to Mrs. Mattie Bradley Sparks Licker of Aurora, Ind., at Cincinnati, August 22.

Byron Porter Walker, M.D., West Monterey, Pa., to Miss Dorcas Neal Johnston of Pittsburgh, Pa., August 26.

Paul Carleton Colegrove, M.D., Iowa City, Iowa, to Miss Mildred A. Kerlin of Storm Lake, Iowa, June 11.

James Harvey Black, M.D., Dallas, Tex., to Miss Alleen Marie Patton of Catlettsburg, Ky., September 4.

Leo Paul Van Rie, M.D., Mishawaka, Ind., to Miss Lillian Oschulsky of Chicago, at Mishawaka, August 19.

Charles Schram, M.D., New York City, to Miss Anna Levi of Cincinnati, at Zurich, Switzerland, recently.

Everett Woods Maechtle, M.D., West Allis, Wis., to Miss Velma Vinal of Appleton, Wis., August 20.

Edmund Simpson Boice, M.D., Richmond, Va., to Miss Lyall E. Caughy of Baltimore, August 20.

Rev. Samuel Lichner, M.D., Chicago, to Mathilda Osborne, M.D., of Philadelphia, August 20.

Frank P. Gaunt, M.D., Nanking, China, to Miss Eugenia Moore of Macon, Mo., August 19.

Francis Roman Wise, M.D., to Miss Rupp, both of York. Pa., in Harrisburg, August 18.

J. S. Bardin, M.D., to Miss Worthie Bell Putman, both of Fort Worth, Tex., August 6.

George Buol, M.D., Ravenna, Neb., to Miss Urilla Rudy of Lincoln, Neb., August 8.

John Lick Groh, M.D., Faxman, Pa., to Miss Blanche Myers of Everett, Pa., recently.

E. R. Arn, M.D., to Miss Minna Marie Wannagat, both of Dayton, Ohio, August 27.

Deaths

Eugene Fauntleroy Cordell, M.D. for many years Maryland correspondent of The Journal, died in Baltimore, August 27, a week after an operation for abscess of the rectum; aged 70. He was born in Charlestown, W. Va., received his preliminary education in the Charlestown Academy and the Episcopal High School of Virginia. He then entered the University of Maryland, Baltimore, and was graduated from its school of medicine in 1868. For many years he was a member of the faculty of his alma mater as professor and honorary professor of history of medicine. He was also librarian of the School of Medicine of the University, and editor of "Old Maryland." His society membership included the American Medical Association; the Medical and Chirurgical Faculty of Maryland, of which he was president in 1904; the Literary and Historical Society of the University of Maryland, of which he was once president; the General Alumni Association of the University of Maryland, of which he was secretary for many years; the Johns Hopkins Hospital Historical Club, the Association of American Medical Librarians and other scientific societies. From 1896 to 1904 he was also professor of the principles of the practice of medicine in the Women's Medical College, Baltimore. In the death of Dr. Cordell the United States has lost one of its foremost medical historians, Maryland, a savant devoted to historical research, and The Journal of the American Medical Association a most faithful and competent correspondent.

Duff W. Greene, M.D. Medical College of Ohio, Cincinnati, 1876; of Dayton, Ohio; a fellow of the American Medical Association; a specialist on diseases of the eye; a member of the Medical Staff of the National Military Home, Dayton, for 29 years, and for 27 years chief of the ophthalmologic staff of St. Elizabeth's Hospital, Dayton; died suddenly in his automobile, August 16, from heart disease, aged 62.

John Crannell Minor, M.D. College of Physicians and Surgeons, New York City, 1865; a member of the French Medical and Surgical Society and a fellow of the Royal College of Physicians and Surgeons, who served throughout the Civil War as medical cadet, assistant surgeon and surgeon; died at the home of his nephew at Waterford, Conn., August 16, from cerebral hemorrhage, aged 69.

Frederick Llewellyn Bartlett, M.D. Homeopathic Medical College of Missouri, St. Louis, 1868; for 61 years a resident of Aurora, Ill., and once mayor of that city; for ten years a member of the board of directors of the Public Library and for three years its president, and for eighteen years president of the board of education of West Aurora; died at his home August 7, from uremia, aged 69.

Edwin Motley Fuller, M.D. Medical School of Maine, Brunswick, 1873; a fellow of the American Medical Association, and once president of the Maine Medical Association; for twenty years a member of the Medical Corps of the National Guard of the state and prominent in civil affairs; died at his home in Bath, August 8, from septicemia, aged 63.

Emily H. Wells, M.D. Women's Medical College of the New York Infirmary for Women and Children, New York City, 1873; a member of the Medical Society of the State of New York, and at one time president of the Broome County Medical Association; died at her home in Binghamton, August 20, from heart disease, aged 72.

Christian Van der Veen, M.D. University of Michigan, Ann Arbor. 1898; of Grand Rapids, Mich.; a member of the Michigan State Medical Society; once president of the Grand Rapids Academy of Medicine; secretary of the staff of the Butterworth Hospital; died in the Inez Mosher Hospital, August 10, from erysipelas, aged 40.

William Albert Davis, M.D. University of Pennsylvania, Philadelphia, 1876; a fellow of the American Medical Association; physician-in-chief to the Cooper Hospital at Camden, N. J., and consulting physician and director of the Camden City Dispensary; died suddenly at his home, August 17, from heart disease, aged 63.

Cleveland Ferris, M.D. Yale University, New Haven, 1903; a fellow of the American Medical Association and the New York Academy of Medicine; assistant genito-urinary surgeon to the New York Polyclinic and outpatient department of St. Luke's Hospital, died at his home at New York City, August 21, aged 36.

Robert P. Hunter, M.D. Jefferson Medical College, 1869; a member of the Medical Society of the State of Pennsylvania; a veteran of the Civil War; a member of the Pennsylvania legislature in 1911 and 1912, and a school director of Leechburg, Pa., was found dead in his bed in that place, August 13, aged 77.

H. Clay Hart, M.D. Philadelphia University of Medicine and Surgery, 1869; a veteran of the Civil War; at one time a member of the city council of Spencerville, Ohio, and a member of the school board; died at his home near Southworth, Ohio, August 11, from carcinoma of the face, aged 72.

Augustus Maverick, M.D. University of Pennsylvania, Philadelphia, 1907; a fellow of the American Medical Association; a prominent young practitioner of San Antonio, Texas; was shot and killed at his home, August 18, while endeavoring to protect one of his servants from assault, aged 28.

William B. Hostetler, M.D. Albany (N. Y.) Medical College, 1865; a member of the Illinois State Medical Society; for many years local surgeon of the Wabash system in Decatur, where he had practiced for forty-six years; died at his home, August 21, from heart disease, aged 70.

Hubbard Winslow Mitchell, M.D. College of Physicians and Surgeons, New York City, 1886; a surgeon in the navy during the Civil War; a member of the staff of Bellevue Hospital and consulting physician to Roosevelt Hospital, New York City; died at his home, August 12, aged 70.

Emma Therun Pettingill Allen, M.D. New York Medical College and Hospital for Women, New York City, 1892; a member of the visiting staff of the Brooklyn Memorial Hospital for Women; died at her home in Brooklyn, August 9, from malignant disease, aged 68.

John William Fielder, M.D. Medical College of Alabama, Mobile, 1905; of Benton, Ala.; a member of the Medical Association of the State of Alabama; died in a sanatorium in Selma, Ala., August 14, from the effects of strychnin self-administered, aged 30.

William C. Gayley, M.D. University of Pennsylvania, Philadelphia, 1881; a fellow of the American Medical Association, and a member of the Board of Trustees of the Hazleton (Pa.) State Hospital; died suddenly at his home in Hazleton, August 16, aged 54.

John G. Huck, M.D. College of Physicians and Surgeons, Baltimore, 1882; a fellow of the American Medical Association, and a well-known practitioner of Northwest Baltimore; died in Johns Hopkins Hospital, August 13, from heart disease, aged 63.

Allan Blair Bonar, M.D. College of Physicians and Surgeons, New York City, 1890; of Memphis, Tenn.; while on a visit to his mother at Detroit, died in Grace Hospital, August 14, from disease of the liver due to malaria, aged 50.

Matthew Moore Butler, M.D. Jefferson Medical College, 1860; assistant surgeon and surgeon of the Thirty-Seventh Virginia Infantry, C. S. A., during the Civil War; died at his home in Bristol, Tenn., August 12, aged 75.

Peter Herman Muus, M.D. Minneapolis College of Physicians and Surgeons, 1901; in 1905 mayor of Kensington, Minn., and later a practitioner of Albert Lea; died at his home August 12, aged 39.

Charles M. H. Schwartz, M.D. University of Iowa, Iowa City, 1880; formerly of Lyons, Iowa; died at the home of his daughter at Mooseman, Canada, August 10, from cerebral hemorrhage, aged 64.

Abraham P. Frick, M.D. University of Pennsylvania, Philadelphia, 1861; local surgeon at Aransas Pass, Texas, for the San Antonio and Aransas Pass Railroad; died at his home, July 11.

George Dutton Ladd, M.D. Rush Medical College, 1875; a member of the Wisconsin State Medical Society, and president in 1890; died at his home in Milwaukee, August 15, aged 63.

Jeromus Rapelye (license, New York), a practitioner since 1864; a veteran of the Civil War; died at his home at Maspeth, N. Y., August 12, from senile gangrene, aged 78.

Theodore Wigand, M.D. University of Marburg, Germany, 1873; a practitioner of California since 1877; was killed in San Francisco August 12, in an automobile accident.

William J. Clontz, M.D. Vanderbilt University, Nashville, Tenn., 1887; of Alexander, N. C.; was shot and almost instantly killed in that place August 11, aged 58.

Giles Harris, M.D. Kentucky School of Medicine, Louisville, 1880; died at his home in Richmond, Ky., August 10, aged 68.

Frank Walton, M.D. Vanderbilt University, Nashville, Tenn., 1899; a fellow of the American Medical Association; was shot and killed at Mulga, Ala., August 18, aged 38.

Joseph F. Blount (license, Indiana, 1897), for many years a practitioner of Evansville, Ind.; died at his home in that city, August 16, from senile debility, aged 86.

Edward G. Forshee, M.D. Cincinnati College of Medicine and Surgery, 1864; died in his home at Kinmundy, Ill., July 10, from acute gastritis, aged 78.

Charles Wilbor Ray, M.D. Bennett Medical College, Chicago, 1885; formerly of Nicollet, Minn.; died at his home in Los Angeles, August 12, aged 57.

Lewis J. Burch, M.D. Atlanta College of Physicians and Surgeons, 1904; of Waycross, Ga.; died in a sanatorium in Atlanta, August 2.

Thomas Wilson Monroe (license, Massachusetts, years of practice), died at his home in Milford, July 10; aged 68.

William Ely Jones, M.D. Miami Medical College, Cincinnati, 1890; died at his home in Cincinnati, August 11, aged 44.

Correspondence

Tuberculosis Acquired through Ritual Circumcision

To the Editor:—My attention has been drawn to an article with this title in THE JOURNAL, July 12, 1913, p. 99, by Dr. E. Emmett Holt. He concludes his article thus: "While the number of reported instances of tuberculosis acquired through circumcision is considerable, there must be a very much larger number that have never found their way into literature. It is certain also that syphilis has been spread in this manner. These facts lead me to emphasize the statement made by the late Professor Maas, the German surgeon, that 'it is the duty of the physician to raise his protest against the performance of ritualistic circumcision in every case.'"

I assume that Dr. Holt does not thus protest against all circumcision, for every physician recognizes its desirability and its necessity in his practice. And I assume that he does not protest against its being regarded by us as a religious duty, for a religion which inculcates physical as well as spiritual health must command the respect and admiration of all men. I assume therefore, that Dr. Holt objects merely to certain details of the operation as performed by some practitioners. In this he is correct.

The operation itself, as practiced, consists of three details:

1. The "Milah" or excision. For this modern surgery demands that the instrument used shall be properly sterilized before the operation.
2. The "Periah" or separation of the inner lining of the prepuce from the glans. For this modern surgery demands that a proper forceps shall be substituted for the fingers or thumb.
3. The "Metsitsa" or suction of the blood from the wound. For this modern surgery demands that a hemostat shall, when necessary, be employed to replace such a method of hemostasis.

The operation antedates by many centuries, indeed, by thousands of years, modern surgical methods. Less than a single century ago, hemostasis by hot oil or hot pitch was countenanced by accepted surgery. It required time to bring about changes to modern methods. Much less time will be required to improve the methods complained of in "ritualistic" circumcision, particularly when we remember not only that many Jewish operators in America use modern methods of asepsis, and that in such countries as England, France, Germany and Scandinavia they may not otherwise practice, but also that the Jewish religious law insists on every precaution in matters of health and demands that when "Sekanah" or "danger" to health is critically involved, any religious custom and any duty not may, but must, be overridden.

We must further remember that all the offending operators are from Russia, Roumania, Hungary, Galicia, etc., where universities and medical schools close their doors to Hebrews or receive but very few; where cruel prejudices further shackle them; where unjust laws impose further restrictions, and where, for that matter, general medical and surgical practice is in the hands of "felchers" or imperfectly trained barbers.

A few operators may demur at changes, for old customs die hard. But the operators, as a body, are open to reason and will be found obedient to all requirements, especially when told authoritatively by their religious leaders that their present methods have in them elements of "Sekanah" or "danger." I can imagine nothing that would fill them with greater horror or with more genuine sorrow than to know that they endanger life.

Some time ago, as president of the Union of Orthodox Jewish Congregations, I appointed a committee on this very matter, and subsequently I drew the attention of this local branch of the American Jewish Committee to the subject. Dr. Holt's article will spur both committees to further action.

H. Pereira Mendes, M.D., New York.
Minister Spanish and Portuguese Congregation.

Need for Inexpensive Obstetric Nurses

To the Editor:—Dr. Milligan's letter on this subject (The Journal A. M. A., Aug. 23, 1913, p. 617) treats of a matter that is of tremendous importance in St. Louis, as well as in Detroit. He bewails the fact that there is not a supply of clean, sensible, practical nurses whose services may be had by the family of small means. We have nurses of this kind, but they are failures because they belong to one of the two following classes:

Class 1 consists of women who, after helping in twenty or more cases, feel confident of their ability to manage an obstetric case without the guiding hand of a physician. Some of these women are honest. Their chief defect is that they are not aware of the extent of their ignorance. Some are not so honest, produce abortions occasionally, and make a miserable failure of their avocation. This is the class that injures the reputation of all practical nurses. Most women of this class have had no hospital training.

Class 2 consists of clean and willing workers who are aware of the deficiencies of their training and who attempt to make up for this deficiency by blindly and loyally abiding by the instructions of the physicians. A woman of this class is always busy, and as the supply does not equal the demand, she is soon justified in increasing her charges. Most women of this class are no longer very youthful and have had some hospital training. Strictly speaking, these women are not failures, but they are classed as failures here, because they are no longer to be had by the family of small income.

The poor man has a right to expect physicians' services at reduced rates. He cannot, however, make a similar claim against the graduate nurse, because she is already miserably underpaid.

I agree, therefore, that a supply of nurses who have had six months' training in a few essentials would place a poor man's wife in a safer position.

W. C. Gayler, M.D., St. Louis.

Queries and Minor Notes

Anonymous Communications and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

GELATIN MOUNTING AND PRESERVATION OF GROSS SPECIMENS

To the Editor:—Will you kindly publish reference or give brief description of latest and best technic for gelatin mounting and preservation of gross specimens?

E. W.

Answer.—In the issue of The Journal for May 17, 1913, p. 1586, is given a method for preserving gross specimens in a sugar solution. The tissue is immersed in the usual formaldehyd solution for from six to twelve hours, then in 50 per cent. alcohol from twelve to twenty-four hours and then it is transferred to an oversaturated solution of beet-sugar. Only enough water is added to dissolve some of the sugar, leaving a little sugar in the bottom of the jar. That is a permanent mount.

In 1902 W. H. Watters of Boston published a method of molding specimens in gelatin. The specimen was fixed for from two to four days in Kaiserling No. 1, then from three to five days in Kaiserling No. 3, and then it was embedded in the following mixture: Kaiserling No. 3, 15 parts; gelatin, 1 part. This mixture is rendered liquid in a hot-water bath. To this is added the white of one egg and the mixture is heated until coagulation of the albumin is complete. The solution is then carefully filtered and allowed to cool. It is now ready for use. Specimens prepared in the usual way for Kaiserling solutions are cut into sections of about 1 cm. thickness in such a manner that one of the flat surfaces shows the features desired. Into a Petri dish is poured a thin layer of the gelatin solution now cooled to from about 30 to 35 C. (from 86 to 95 F.), and in this the section is placed face downward. The gelatin soon solidifies and thus holds firmly and evenly against the glass the particular surface desired to be seen. The entire Petri dish is now filled with gelatin solution till a convexity is formed above the edges. A square glass plate is removed from a basin of water and placed, while still wet and with the rough surface down, over the Petri. If this procedure is performed carefully, touching first one edge of the dish with the plate and then dropping it slowly, a wave of gelatin will be formed which will force out any air bubbles that may be present. The plate is placed in proper position and the entire preparation left to harden, which it will do quite well in from half an hour to two hours, according to its initial temperature and the degree of room heat. After the superfluous gelatin has become solid it is removed by a coarse brush immersed in water. The glass is then dried, a layer of Canada balsam is applied to seal the point of union between the plate, which we now recognize as the base, and the Petri dish, which now forms the top of the mount, and the name of the specimen is written in ink on the ground glass. In a day or two the balsam will be dry and the preparation has been completed.

BLOOD-PRESSURE AND THE EFFECT OF ALTITUDE

To the Editor:—1. What is considered normal blood-pressure in man?

2. What is the effect of altitude on blood-pressure? Does an altitude of 7,000 feet make any difference in blood-pressure?

G. W. Linville, M.D., Woodmen, Colo.

Answer.—1. The normal blood-pressure may be stated as an average of 127 for males, all ages, and 120 for females. There are many circumstances which cause a variation from the average. The blood-pressure tends to rise with age, so that a pressure considerably above the average at the age of 60 might not be abnormal.

2. The blood-pressure is diminished with altitude, the difference at 6,000 feet being about 5 mm.; but long residence at high altitude tends to make it return to nearly the normal figures. The fall of systolic pressure is slightly greater and more certain to occur than the fall of diastolic pressure. High altitudes do not affect all persons in the same degree, and small elevations in altitude do not materially influence blood-pressure.

Reference may be made to the work of Charles F. Gardiner, M.D., and Henry W. Hoagland, M.D. (*Tr. Am. Climatol. Assn.*, 1905, xxi, 80); and those of Y. Henderson (*ibid.*, xxviii), and of W. A. Campbell, (*ibid.*, xxviii, 16).

RELATIVE THERAPEUTIC VALUE OF SALVARSAN AND NEOSALVARSAN

To the Editor:—Please answer the following questions with reference to salvarsan and neosalvarsan:

1. Which is the least toxic?
2. Which gives the better results (therapeutically)?
3. Which is the better preparation (*a*) for intramuscular work; (*b*) for intravenous?
4. Being away from a laboratory doing the Wassermann, as a general rule how many doses would be considered sufficient, the patient receiving the first dose during the primary or secondary stages?

J. C. M.

Answer.—1. There appears to be no essential difference.

2. The two are believed to be practically identical in their therapeutic effects. Some authors, however, who have tried both prefer salvarsan.

3. (*a*) Probably salvarsan. (*b*) Probably neosalvarsan.

4. The physician who undertakes the treatment of a case of syphilis should be prepared either to perform the Wassermann test himself or to have it done at a laboratory. Specimens of blood can easily be sent for such examinations. It is impossible to state positively how many injections are needed. The proper treatment of this disease requires the administration of mercury as well as salvarsan. The physician must be guided in the use of salvarsan by the condition of the patient and the character of the Wassermann reaction as to whether he shall use one or more injections of salvarsan in a series, and the number of series required, as well as the interval between them.

WALNUT JUICE AS A HAIR-DYE

To the Editor:—*Please give me the following information: 1. What is a good, harmless dye for making the hair black? 2. Is walnut stain a good, permanent dye? 3. Where can a trustworthy preparation of walnut stain be bought? 4. Is henna better, and what is a trustworthy preparation of this substance?*

ANSWER.—1. There is no hair-dye that is exactly satisfactory and none that can be guaranteed harmless under all circumstances. Analyses and published formulas of hair-dyes show that most of them contain one or more of the following substances in addition to solvents or ointment bases: salts of bismuth, copper, iron, lead, silver and vanadium, ammonium sulphid, ammonium carbonate, hydrogen dioxid (in conjunction with tinctorial substances) pyrogallol, paraphenylen diamin (and other anilin dyes), henna and walnut juice. Several of the less objectionable formulas for black hair-dyes were given in THE JOURNAL A. M. A., Oct. 14, 1911, p. 1305.

2. Authoritative information is lacking concerning the permanence of walnut juice as a hair-dye. Walnut juice alone produces a brown stain on the hair, but a darker color may be obtained by using it in conjunction with some nigrescent substance such as resorcinol or pyrogallol. The following formulas were published in the *Druggists' Circular*, August. 1907, p. 545:

	gm. or c.c.	
Green walnut hulls	40	ʒ x
Resorcinol	4	ʒ j
Glycerol	60	fl℥ ij
Water	enough	

Grate the hulls and boil in 500 c.c. or a pint of water for thirty minutes, strain, add the resorcinol, glycerol and enough water to make 400 c.c. or 14 ounces.

	gm. or c.c.	
Copper chlorid	150	℥ v
Distilled water	325	℥ xi
Stronger ammonia water ...	150	fl℥ v

Mix and add gradually. with constant stirring to a solution of:

	gm. or c.c.	
Pyrogallol	200	℥ vii
Hydrochloric acid	675	℥xxiiss
Distilled water	1,000	℥ xxxii

Then add with stirring·

	gm. or c.c.	
Stronger ammonia	190	℥ viss
Solution of hydrogen dioxid	950	℥ xxxii
Water enough to make ...	*4,000*	℥ *cxxviii*

Store in a wide-mouthed jar exposed to the air for fourteen days, stirring the liquid occasionally.

3. It is probable that most of the commercial preparations which use such expressions as "walnut stain," "walnut tint," etc., as selling points do not contain any walnut juice, but depend for their colorific properties on some of the synthetic dyes, such as paraphenylen diamin. (THE JOURNAL A. M. A., April 3, 1909, p. 1121, and Oct. 16, *1909*, p. *1307.*)

4. Henna stains the hair yellow.

LAVAGE IN CASES OF HEMORRHAGE

To the Editor:—In THE JOURNAL, July 26, 1913. p. 256, Dr. Billings states: "In hemoptysis due to chronic ulcer of the stomach, hemorrhage may not cease so long as the stomach is distended with blood and other contents. Lavage with normal salt solution, until the stomach is empty, is safe and often effective." I dislike to express a contrary opinion, but it appears to me that a statement like the above is a dangerous one to make for obvious reasons. To my mind, such advice needs some reservation or limitation.

W. F. VON ZELINSKI; Chicago.

ANSWER.—Lavage in cases of hemorrhage of the stomach is recommended by a number of authors and under the conditions indicated by Dr. Billings is fully justified. Our correspondent's opinion emphasizes the necessity of following advice with due consideration of the conditions present, and the proper caution in the manipulations necessary.

DURATION OF IMMUNITY FROM TETANUS AFTER INJECTION OF ANTITETANIC SERUM

To the Editor:—Recently a client brought to my office his son, who had stepped on a rusted nail. I advised a prophylactic injection of antitetanic serum, which was given. After the injection my client asked, "How long will my son now be protected against tetanus?" Please give me your opinion.

R. A. C.

ANSWER:—Tetanus antitoxin is *eliminated* from the system from eight to ten days after injection. It remains in practically undiminished amount for a week and then rapidly diminishes to nothing in the course of a few days. Therefore the immunity conferred is protective for not more than a week.

EPIPHANIN AND NINHYDRIN REACTIONS

To the Editor:—Please give information with regard to the following: (1) epiphanin reaction, (2) ninhydrin reaction.

C. E. McBRAYER, M.D., Haines, Alaska.

ANSWER.—1. The epiphanin reaction is applied to the detection of antibodies in the blood-serum, especially in the serodiagnosis of syphilis. The technic depends on a change of reaction to phenolphthalein in a neutralized solution. A mixture of the suspected solution and of an extract from a syphilitic organ are made as follows: 0.1 c.c. of a 10 per cent. solution of the serum in physiologic salt solution is mixed with 0.1 c.c. of an alcoholic extract of a syphilitic fetal liver. To this is slowly added 1 c.c. of decinormal sulphuric acid and 1 c.c. of an exactly equivalent solution of barium hydroxid. On the addition of a drop of phenolphthalein solution, the fluid turns red if the serum is from a syphilitic, while there is no change in tint with the serum of a non-syphilitic person. See also Abstract 74, THE JOURNAL, Jan. 21, 1911, p. 228.

2. Ninhydrin is a proprietary name for triketohydrindenhydrate, used as a reagent for proteins and amino-acids. The reagent gives a blue color with all compounds which have an amino group in the alpha position to the carboxyl. It is used for the detection of peptone or amino-acid in a test for pregnancy as follows: About 1 gm. of coagulated placental tissue, which on boiling with water yields no compounds which react with ninhydrin, is placed in a diffusion cell and covered with from 2 to 3 c.c. blood-serum and the mixture dialyzed in 20 c.c. distilled water. The contents of the cell and the outer fluid are covered with a layer of toluol. Dialysis is continued from twelve to sixteen hours at a temperature of 37 C. in the incubator. To 10 c.c. of the dialysate 2 c.c. of a 1 per cent. aqueous solution of ninhydrin are added. The mixture is heated and kept at the boiling point for just one minute. If the serum is derived from a pregnant woman, a blue coloration of the dialysate occurs. This coloration is absent if the serum is from a person who is not pregnant.

ABDERHALDEN'S SERUM DIAGNOSIS OF PREGNANCY

To the Editor:—Please give me the address of Dr. Abderhalden, the originator of the biologic test in the diagnosis of pregnancy, and directions for the preparation and administration of the test.

C. D. BOUVIER, Berkeley, Cal.

ANSWER.—Professor Emil Abderhalden, Professor of Physiology, Halle University, Halle, Germany.

Abderhalden's test for pregnancy is based on the observation that when foreign substances are introduced into the blood a specific ferment is elaborated which is capable of decomposing these materials; thus in pregnancy cells from the placenta enter the blood and excite the formation of ferments capable of digesting the placental cells. The products of this decomposition of placental cells are diffusible protein derivatives, either peptones or amino-acids. If, therefore, a piece of placental tissue is acted on by the serum of a pregnant woman, the cells of the placenta will be decomposed, and soluble and diffusible products will be formed. When such a mixture is placed in a diffusion cell the products of the digestion diffuse into the water surrounding the cell and may be detected in the dialysate. If the serum is from a non-pregnant woman, no specific ferments are present, and hence no digestion takes place and no products diffuse into the dialysate. Abderhalden employs the ninhydrin reaction for testing the presence of these protein derivatives in the dialysate. It is evidently necessary before applying this test to make sure that the material tested contains nothing which can diffuse through the membrane so as to give the reaction. Abderhalden states that it is not enough to test the placental tissue and the serum by themselves, but that a test of the two combined must be made.

The biologic test for pregnancy, according to Abderhalden, is carried out as follows: About 1 gm. of coagulated placental tissue is boiled with ten times its volume of water, the water poured off and this treatment repeated until the liquid contains nothing which will give a reaction with ninhydrin. When it no longer responds to the ninhydrin test it is placed in a diffusion cell with from 2 to 3 c.c. of blood-serum, and the mixture is allowed to diffuse into 20 c.c. of distilled water. Both the dialysate and the liquid in the cell are covered with a layer of toluol. The dialysis is continued for from twelve to sixteen hours in the incubator at a temperature of 37 C. (98.6 F.).

To 10 c.c. of the dialysate 0.2 c.c. of a 1 per cent. aqueous ninhydrin solution is added, and the test performed as follows: The mixture is placed in a test-tube and boiled for exactly one minute. If protein derivatives are present, the mixture will turn blue and it may be assumed that the serum comes from a pregnant woman. If no color appears, it is to be assumed that the serum is from a non-pregnant woman.

Abderhalden also tests for pregnancy by mixing the serum with a solution of peptone derived from the placenta. If the peptone is decomposed, a change in the optical rotatory power will occur which can be detected by examining the mixture in a special polarimeter devised by Abderhalden. This method is more expensive than the dialysis method, but is said to be more accurate.

The following is a list of references on Abderhalden's serum diagnosis of pregnancy:

Judd, Charles C. W.: The Serum Diagnosis of Pregnancy, THE JOURNAL, June 21, 1913, p. 1947.

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Heimann, F.: Serodiagnosis of Pregnancy, *München. med. Wchnschr.*, April 29, 1913; abstr., THE JOURNAL, June 7, 1913, p. 1841.

Behne: Biologic Test for Pregnancy, *Zentralbl. f. Gynäk.*, April 26, 1913; abstr., THE JOURNAL, May 31, 1913, p. 1754.

Abderhalden, E., and Freund, R.: Serodiagnosis of Pregnancy and Cancer, *München. med. Wchnschr.*, April 1, 1913; abstr., THE JOURNAL, May 17, 1913, p. 1568.

Schlimper, H., and Hendry, J.: Serodiagnosis of Pregnancy, *München. med. Wchnschr.*, April 1, 1913; abstr., THE JOURNAL, May 17, 1913, p. 1586.

Williams, P. F., and Pearce, R. M.: Abderhalden's Biologic Test for Pregnancy, *Surg., Gynec. and Obst.*, April, 1913; abstr., THE JOURNAL, May 3, 1913, p. 1396.

Petri, T.: Serodiagnosis of Pregnancy, *Zentralbl. f. Gynäk.*, Feb. 15, 1913; abstr., THE JOURNAL, March 22, 1913, p. 951.

Lindig, P.: Serodiagnosis of Pregnancy and Tumors in Genital Organs, *München. med. Wchnschr.*, Feb. 11, 1913; abstr., THE JOURNAL, March 23, 1913, p. 950.

Veit, J.: Serodiagnosis of Pregnancy, *Ztschr. f. Geburtsh. u. Gynäk.*, Dec. 21, 1912; abstr., THE JOURNAL, Feb. 15, 1913, p. 562.

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Engelhorn, E.: Unreliability of Dialysis Technic for Serodiagnosis of Pregnancy, *München. med. Wchnschr.*, March 18, 1913.

Ekler, R.: Reliability of Serodiagnosis of Pregnancy, *Wien. klin. Wchnschr.*, May 1, 1913.

Henkel, M.: Serodiagnosis of Pregnancy, *Arch. f. Gynäk.*, Feb. 8, 1913.

Schwarz, Henry: The Serodiagnosis of Pregnancy, THE JOURNAL, Aug. 16, 1913, p. 484; The Practical Application of Abderhalden's Biologic Test of Pregnancy, *Interstate Med. Jour.*, May, 1913, p. 393; Abderhalden's Serodiagnosis of Pregnancy and Its Practical Application, *Interstate Med. Jour.*, March, 1913, p. 195.

THE AMERICAN HOSPITAL OF PARIS

To the Editor:—Please give a brief outline of the (1) history, (2) location, (3) resident staff, (4) facilities, (5) departments, (6) maintenance, etc., of the American Hospital of Paris.

M. Q.

ANSWER.—Write to the American Hospital of Paris, 55 Boulevard du Château, Neuilly-sur-Seine, Paris, France.

Medical Economics

THIS DEPARTMENT EMBODIES THE SUBJECTS OF POSTGRADUATE WORK, CONTRACT PRACTICE, LEGISLATION, MEDICAL DEFENSE, AND OTHER MEDICOLEGAL AND ECONOMIC QUESTIONS OF INTEREST TO PHYSICIANS

NEWSPAPER COMMENTS ON PUBLIC HEALTH TOPICS

Newspaper comments on public health topics are increasing both in frequency and in seriousness of consideration. A few years ago an editorial on a health topic in a daily newspaper was a curiosity, and the views of the majority of newspaper editors on this subject were too often hazy or flippant. To-day, the leading newspapers of the country recognize that the conservation of the public health is one of the most serious subjects which can be discussed in their columns. The change in public sentiment during the last six years, as reflected by the editorial columns of the leading newspapers, is most striking. Even the more radical proposals of those interested in eugenics have not failed to secure commendation from many of the big newspapers, at least so far as the spirit of the proposed regulation is concerned.

State Regulation of Marriage

The Memphis (Tenn.) *Commercial Appeal,* commenting on the passage of the radical law for the restriction of marriage in Wisconsin, says:

"Wisconsin has blazed the way . . . . Realizing the advantage of a strict marriage law, by an overwhelming majority in both branches, the legislature has passed one which will become effective on August 1. It is undoubtedly a radical move, but it is a move which will certainly be followed by other states in a very short time. The eugenic problem has been closely studied. It has grown in importance . . . The two measures enacted by the Wisconsin legislature are drastic enough to satisfy the most extreme advocate of the new cause. Both measures apply to marriage and the future of the race . . . Common sense shows the great advantage of both of these laws. Too many people, unfitted for marriage, rush into the responsibility of such an estate without realizing what the future will be. Men and women afflicted in a way which should prohibit their marriage do not profit by this knowledge and suffer afterward."

The Chicago *Record-Herald* is in sympathy with the movement, but sounds a warning, the keynote of which is a quotation from a British physician to the effect that the United States has "possibly gone too far" in eugenics legislation. Regarding the discussion in the different state legislatures, the *Record-Herald* looks on some of it as experimental, some as sensible and simple and some as perhaps unduly in advance of true scientific knowledge:

"The marriage certificate is an excellent safeguard within reason. To demand perfect health, instead of freedom from certain diseases, is to encourage immorality and to make our last state worse than the first. The business of students of eugenics is quite as much to tell legislators what not to attempt at this stage as it is to tell them what restrictions social health and social purity render it imperative or at least proper to impose."

The State's Duty in Public Health

The Cincinnati *Enquirer* discusses the relation of the state to health in a broad way, saying:

"It is coming to be taken for granted that as the state is charged with the duty not only of punishing crime, but also of preventing it, so it is also its duty not only to care for all sufferers from disease who are unable to care for themselves, but to use every possible means which modern scientific knowledge has made available to prevent disease."

After discussing governmental quarantine regulations, old-age pensions and industrial insurance in the light of this general belief, the *Enquirer* sees no reason why the state is not justified in securing better hygienic and social conditions in regulating or at least restricting the production of future generations, it says:

"Both lawyers and doctors have been studying the question of the sterilization of idiots, feeble-minded persons, and some classes of criminals, with a view to eliminating them eventually from the social fabric. The doctors, as a whole, have not acted in the matter, although their journals seem favorable to such a law. The lawyers have had a committee report on the subject, which makes no recommendation . . . If the state is justified in entering every man's domicile and insisting that he send his children to school, surely it is of equal or even greater concern to the good of all, both now and for generations to come, that it sees to it that good health is

Book Notices

A System of Treatment. By Many Writers. Edited by Arthur Latham, M.A., M.D. (Oxon.), F.R.C.P. (Lond.), Physician and Lecturer on Medicine, St. George's Hospital, and T. Crisp English, M.C., B.S., F.R.C.S., Senior Assistant Surgeon and Lecturer on Practical Surgery, St. George's Hospital. Vol. I, General Medicine and Surgery. Pp. 1352. Vol. II, General Medicine and Surgery. Pp. 1335. Vol. III, Special Subjects. Pp. 1194. Vol. IV, Obstetrics and Gynecology. Pp. 883. Many illustrations. Cloth. Price, $24 net. New York: Macmillan Company, 1912.

This is a work of almost encyclopedic dimensions, covering the entire ground of medicine and surgery by means of short articles by various authors. Such works are subject to limitations which make a general review very difficult, and a critical judgment must be founded on a thorough and detailed consideration of the entire work. The feature that perhaps is most striking is the brief space necessarily allotted to some seemingly important subjects. Thus the subject of congenital affections of the heart is dismissed with a dozen lines in which must be said that which is to guide the practitioner in dealing with what may be very difficult cases. It would seem that such space might be spared to other topics and the reader referred to text-books which will give him the necessary information as to diagnosis and symptomatology as well as treatment. Another point which must be noted is the attitude toward proprietaries and the readiness with which claims of doubtful validity are accepted by some of the contributors. An unfavorable impression is created by the article on typhoid fever. The following paragraph will probably be instructive to many of the younger American physicians who perhaps have never heard of the method of treatment described, but which is not mentioned in up-to-date American text-books. To others it will sound like an extract from a pamphlet of the previous generation.

> "The Woodbridge Treatment.—This has been introduced in America and is much vaunted. The idea is to produce early in the disease a marked cholagogue, laxative and antiseptic effect by the use in small doses continuously repeated of podophyllin, calomel, guaiacol carbonate, menthol and eucalyptol, followed on the third or fourth day of the disease by the antiseptics and antipyretics guaiacol, menthol and eucalyptol only, with occasional use of the cholagogues. The prescriptions are made into tablets by Parke, Davis & Co., and sold with Woodbridge's directions."

The author seems to think as highly of this treatment as any other. If we take this as a sample of the modern point of view of the work we should perhaps do an injustice. In the treatment of auto-intoxication, however, we find no mention of diet or of the lactic acid bacilli as effective in such cases.

The authors of the various sections are evidently not troubled by any scruples as to the recommendation of proprietary remedies, and the zeal with which this liberty is used is sometimes startling. We have become accustomed to regard it as a blemish on American medical literature that some of our second-class journals permitted the recommendation of a number of nostrums, and it has been thought a proper subject of ridicule to quote examples of their indiscriminate mention. What better example could be cited than the following from W. Soltau Fenwick, who, in the treatment of achylia gastrica, says, "Pepsin, Pepsencia, Lactopeptin or the Peptenzyme Tablets may be prescribed." He says nothing of the necessity of accompanying them by hydrochloric acid. Again, in treating atony of the stomach he informs us without a hint of doubt that "the tabloids of Peptenzyme, which consist of a mixture of all the digestive glands, are occasionally of use."

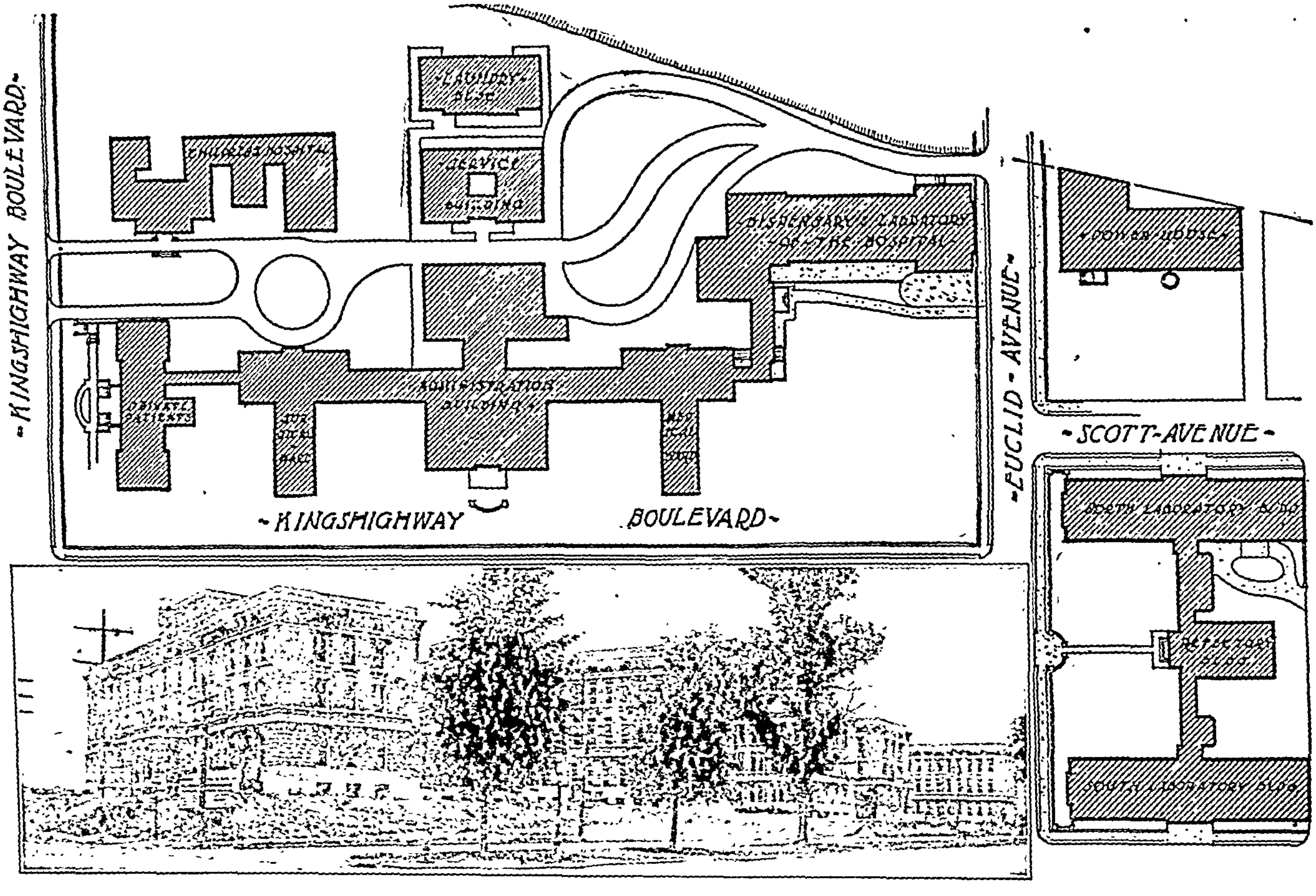
Aside from the faults mentioned and some minor errors, the treatment in general is judicious and will meet the needs of the practitioner for whom it is designed. In the treatment of enuresis by Leonard Williams, thyroid extract in small doses is recommended. The author speaks further of the use by Zanoni and Ferari of suprarenal extract in doses of from 20 to 30 drops of a preparation which he says is not specified. Such an indefinite statement will be very puzzling to the reader who wishes to use this drug. Experiment with other organ extracts is recommended in cases which resist thyroid before resorting to atropin. Another example of recommendation of an indefinite remedy which may turn out to be a nostrum is the notice given to "Lactoserum" in arteriosclerosis. Such a serum is presumably produced by injecting an animal with milk, but the article gives no details as to what animal is used or what technic is followed. A considerable section is devoted to diseases and injuries of the esophagus, but the dilatation of the esophagus as the result of cardiospasm seems to have completely escaped the author's attention. The serum treatment of hemophilia is rather summarily dismissed on the ground that the danger of bleeding from the injection wound contra-indicates it. The articles on genito-urinary affections are thorough, and there are a number of terse summaries which enable the reader to gain a clear impression of the whole subject. In general the description of surgical treatment is good and is well illustrated. The fourth volume is devoted to obstetrics and seems to give the practical help which the practitioner needs. On the whole, we must conclude that the series constitutes a useful work, but we wish that it could have been better. It is a serious question whether a divorce of treatment from other departments of medicine is possible without sacrificing the proper point of view. Must not pathogenesis, symptomatology and etiology determine the treatment, and is it not true that the same name may cover different affections the treatment of which must be different? If this is true it seems that a careful condensation could give us in the same space a treatise on medicine in its entirety which would better meet the needs of the modern physician than the present or any other disconnected exposition of treatment alone.

The Modern Treatment of Nervous and Mental Diseases. By American and British Authors. Edited by William A. White, M.D., Superintendent of the Government Hospital for the Insane, Washington, D. C., and Smith Ely Jelliffe, A.M., M.D., Ph.D., Adjunct Professor of Diseases of the Mind and Nervous System in the Post-Graduate Medical School and Hospital, New York. Volumes I and II. Cloth. Price, $6 net per volume. Philadelphia: Lea & Febiger, 1913.

The somewhat unusual point of view from which this work regards the subject presented is deserving of attention. Instead of beginning with the physical as primary and making the psychic a mere appendage, the authors approach the diseases of the nervous system from a conception of life in which the psychic is deemed worthy of quite as much consideration as the physical. The authors think that previous writers have been too much concerned with details, such as disorders of gait, of power, of sensation and of related phenomena, to the neglect of the larger problem of the individual, the biologic unit and his social relations. "Practically all such works have stopped short where they should have begun. They have told us in large measure how to patch up broken machinery, but rarely have they ever suggested or given directions for avoiding the wrecks." The point of view is essentially therapeutic and optimistic. The attempt is made to give sufficient details so that the reader may apply the methods described with intelligence and confidence. The authors oppose the delegating of any of his functions by the physician to the clergyman or other agency. The physician alone is prepared to understand morbid phenomena, and to him is entrusted the task of correcting them. The field of mental disease is regarded as one of the most fruitful in preventive medicine, and consequently much space is given to discussing the sociologic relations of nervous and mental disease and to the influences of the social environment which tend to produce them.

The work is the result of the collaboration of a large number of contributing writers.

In carrying out their plan the authors have begun with the consideration of eugenics and heredity, and from this proceed to the treatment of sexual relations, impulses and ideas. The treatment of feeble-mindedness, and the social and legal relations of mental defect are then discussed. The psychoneuroses receive extensive treatment. The first volume contains an article of considerable length on the influence of immigration on the incidence of mental disease. In dealing with the minor psychoses the method of Freud receives a thorough description, and the method of psychanalysis especially seems to have the thorough approval of the authors. The second volume deals with disorders of the peripheral nerves, the spinal cord, syphilis of the nervous system and organic diseases of the brain. Dangerous and habit-forming drugs and the surgery of the brain and spinal cord are treated in separate chapters. The value of this work to the medical practitioner must be judged by the fact that not only is he frequently called on to treat the functional nervous affections and minor psychoses and must deal with the first stages of the graver mental disturbances, but also he frequently has occasion to give an opinion or has the opportunity to influence public opinion in regard to the medicolegal and sociologic relations of these conditions. For these purposes the work seems to be an excellent guide.



New Barnes Hospital and Medical Building, Washington University.

Miscellany

MODERN HOSPITALS

During the last year new hospitals have been erected which are to be the teaching hospitals of two medical schools. These are the Peter Bent Brigham Hospital connected with the Harvard Medical School, Boston, and the combined Barnes, Children's and University Hospitals connected with the Washington University School of Medicine at St. Louis. New college buildings are also being erected for the latter medical school. The erection of these new buildings is another evidence of the remarkable development going on in medical education to-day, and is considered of sufficient importance to deserve mention here.

The Peter Bent Brigham Hospital

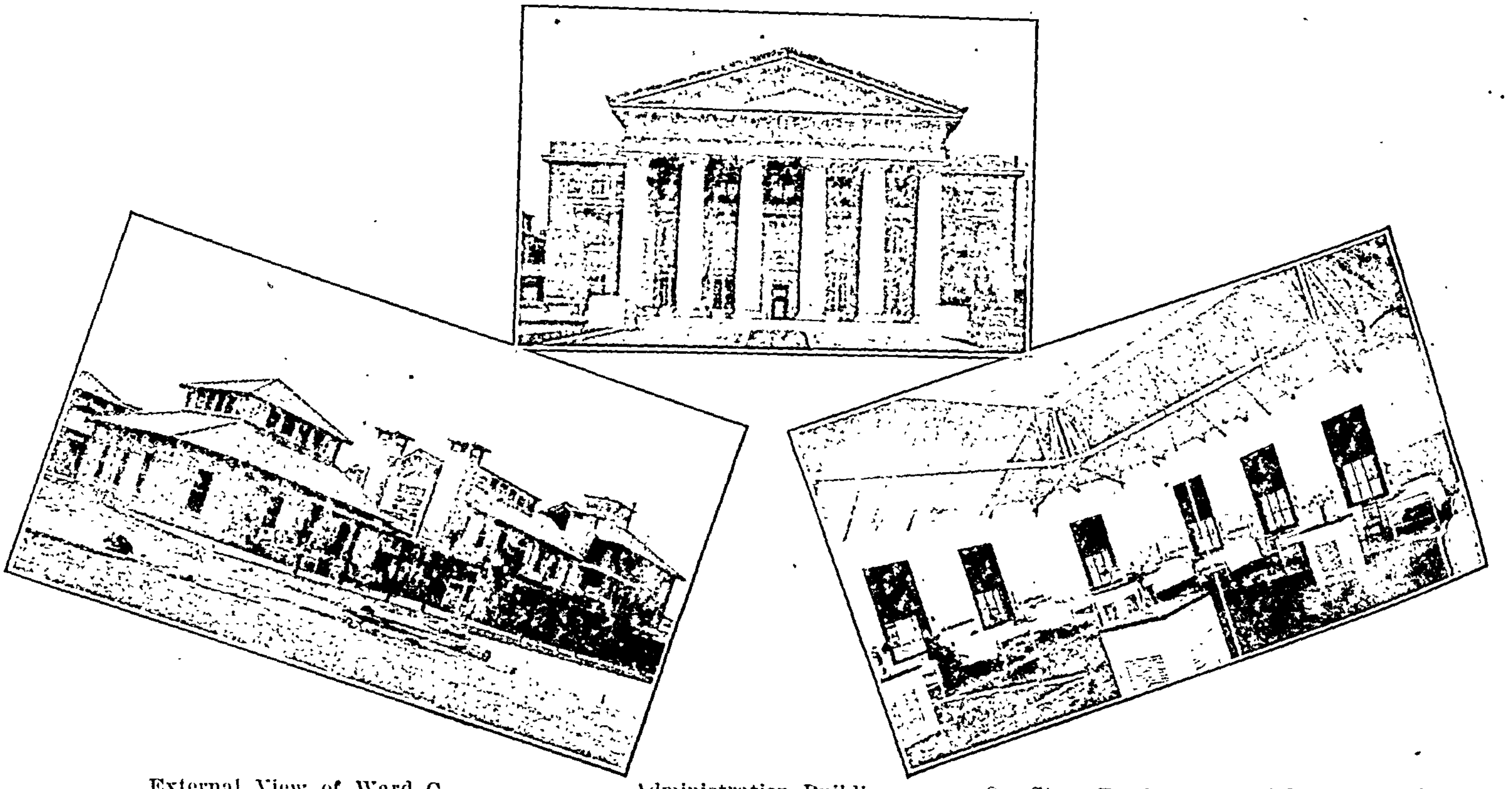
Probably the latest word in hospital construction, architectural, medical and executive, is at the corner of Huntington Avenue and Francis Street, Boston, separated by a private way—Van Dyke Street—from Harvard Medical and Dental Schools, the Cancer Hospital, Children's Hospital, Infants' Hospital and the Carnegie Nutrition Laboratories. Here under the direction of Superintendent Herbert B. Howard, M.D., long known as the superintendent of the Massachusetts General Hospital, on a lot about 1,300 feet by 400 feet has grown up a group of fifteen buildings. Their arrangement connected by a three-story corridor as axis may be the result of the shape of the land but the perfection of detail everywhere evident can have come only from long study by the superintendent and his medical advisors, the trustees and the architects.

The architectural simplicity of the buildings of brick and cement construction is in marked contrast to the white marble of the buildings of Harvard Medical School close by. For this is not primarily a monument to Peter Bent Brigham but a "hospital for any indigent sick resident of Suffolk County whose disease is not contagious or chronic." For land and for the erection of the buildings $1,350,000.00 has been spent, leaving about $4,500,000.00 as a fund for the maintenance of the institution.

The diagram gives the general arrangement. Room is left for the enlargement of the nurses' home and the out-patient building, as may be needed, and for the erection of additional wards. The latter will be like Ward A with its small wards and private rooms, or like Ward C with its open wards and terrace-like structure. At one end each ward is of one story with a monitor top; the central portion is two stories with one large ward and two single rooms on each floor, and at the other end the ward is of three stories, the third story being for isolation purposes and open air treatment. This secures the maximum of light and air to every room and ward. Each of the other buildings to the north is set on a lower level and does not obstruct light or air even to the main wards. Around each ward are wide verandas. Doors everywhere are wide enough for the passage of a bed. The main doors are of heavy oak set in Braun iron frames. Others are light, easily swinging double doors which, by a touch of the foot on a catch, become ordinary doors but are automatically released.

The Administration Building with its dignified pillared front proves that architectural beauty was not forgotten even if it was not made first in the construction of the hospital. Everything centers here at the desk of the clerk in the large rotunda which resembles the desk of a first-class hotel. He is closely connected with the Administrative Department. Every one must enter by the front gate and pass under his eye. There are no steps to climb. Even a wheel chair will easily enter. The single exception is the entrance for doctors and medical students on Vandyke Street, where there is ample parking space for automobiles. But they too must pass the watchful eye of the clerk. There are no back gates or doors.

Patients therefore easily walk or are rolled through the connecting corridor to the admission room in any ward. Adjoining is a large room for the admission bath. A sterilizing closet for clothing is available in one corner. Into bed at once and rolled to the ward is the rule, for every bed is a rolling stretcher. Each bed has easy running wheels with tires of canvas and a little rubber which will not dent on standing. Two of the wheels are on swivels so that one person can control, but can be locked firmly when in the proper location. These beds are the result of long study and their success is attested by the fact that the nurse herself rolls her patient through the wide door into the open air when she wishes without calling for the aid of an orderly. A patient suspected of having a contagious disease is rolled to the elevator in any building, carried to the third story and kept in an isolation room or in the open air. If a contagious disease develops, he is taken down in the elevator still in his bed, and from the open air of the corridor removed to the contagious hospital. This secures a minimum exposure of other patients.



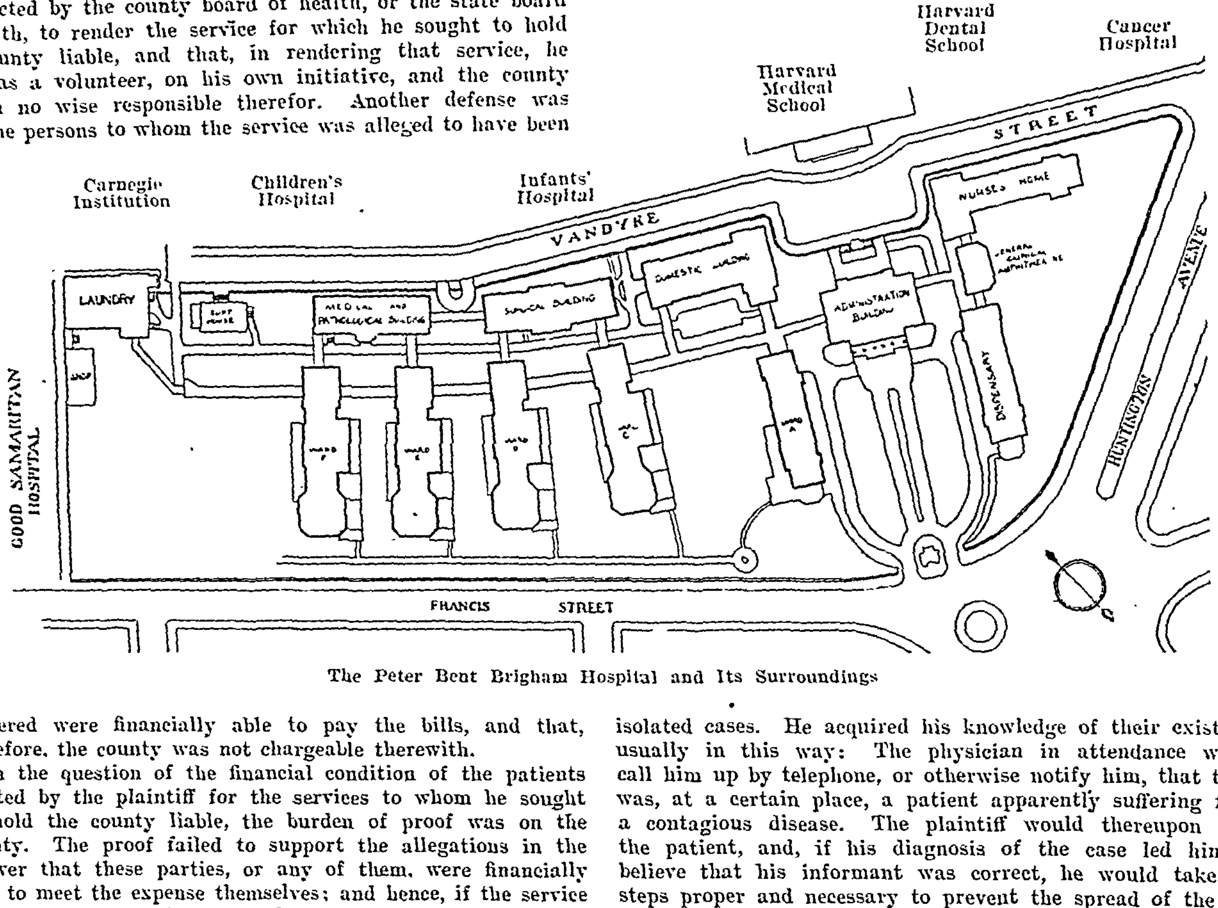
External View of Ward C — Administration Building — One-Story Portion of Ward C, Interior View

Peter Bent Brigham Hospital

The Hospitals and New Medical School of Washington University

Three years ago a gift of approximately $3,000,000 from four prominent citizens of St. Louis—William K. Bixby, Adolphus Busch, Edward Mallinkrodt and Dr. Robert S. Brookings—was announced as having been given for the development of the Washington University School of Medicine. Just previous to that time the trusteees of the Barnes estate had determined to erect a new building for the Barnes Hospital and the trustees of the Children's Hospital likewise were planning to erect a new building for that institution. Fortunately, a close affiliation of all these institutions was formed and it was determined to have a group of new buildings erected in close proximity on a tract of ground at Kingshighway and Euclid Avenue. It was recognized that the hospitals would need an attending staff of high efficiency which Washington University agreed to furnish. On the other hand, it was evident that the medical school needed to have in connection a large modern hospital. In the affiliation agreement between Barnes Hospital and Washington University the latter institution was to erect the new building at an initial cost of approximately $1,000,000, the maintenance to be met from the income of the hospital's endowment—approximately $2,000,000. Thus it was planned to have Washington University Medical School, the Washington University Hospital, the Barnes Hospital and the St. Louis Children's Hospital, formerly widely separated in different parts of St. Louis, brought together and affiliated into practically one institution centering about the Washington University School of Medicine. Plans for the new buildings were carefully prepared along strictly modern lines. The style of architecture used may be called a modified and modernized Colonial. The floors are generally of marble, tile or battle-ship linoleum; wood has been sparingly used. For the walls, marble, glass, enameled brick and tile have been freely employed, not so much as decorative features, however, as in places where sanitary reasons recommended their use. The exterior walls are constructed of an impervious gray brick on all sides, and trimmed with limestone. The cornices and copings are of limestone. The buildings are now rapidly approaching completion. The general relationship of the various structures and the appearance of the buildings when completed are shown by the accompanying cuts. This group consists of the buildings of Washington University School of Medicine, the Barnes Hospital, the St. Louis Children's Hospital and the building for Department of Pathology and the Dispensary. Two other buildings proposed are a Nurses' Home and a Maternity Hospital. All buildings, with the exception of the last two, are expected to be ready for occupancy by Jan. 1, 1914.

Thus we have another great work accomplished in the recent remarkable development of medical education in the United States. The close affiliation formed between the hospitals named and the Washington University School of Medicine are in accordance with the positive trend of the time. It is clear that the three principal functions of an ideal hospital are: (a) the best care of the sick; (b) the training of medical men for the future, and (c) the advancement of medical knowledge. No one of these functions is well performed unless all three functions are being fulfilled. The best conducted hospitals of the day are entirely those which are in close relationship with strong up-to-date medical schools. These seem to be the accepted ideals at the new Medical School of Washington University and its affiliated hospitals.



The Peter Bent Brigham Hospital and Its Surroundings

Medicolegal

Right of Health Officers to Compensation—Acting without Proper Authority

(Hickman County vs. Scarborough (Ky.), 149 S. W. R. 1116)

The Court of Appeals of Kentucky reverses a judgment recovered by Dr. Scarborough, the plaintiff, for services as health officer of Hickman County, holding that, on the showing made, a verdict should have been directed for the defendant county. The court says that the plaintiff, conceiving that his rights were fixed by an order or resolution of the fiscal court of the county fixing the compensation of the health officer, rendered services for which he sought to recover $324, but the defense was interposed that he was not ordered or directed by the county board of health, or the state board of health, to render the service for which he sought to hold the county liable, and that, in rendering that service, he acted as a volunteer, on his own initiative, and the county was in no wise responsible therefor. Another defense was that the persons to whom the service was alleged to have been rendered were financially able to pay the bills, and that, therefore, the county was not chargeable therewith.

On the question of the financial condition of the patients treated by the plaintiff for the services to whom he sought to hold the county liable, the burden of proof was on the county. The proof failed to support the allegations in the answer that these parties, or any of them, were financially able to meet the expense themselves; and hence, if the service was in fact rendered by the plaintiff in his official capacity as health officer of the county and while he was proceeding as directed by the statute, the county should be required to pay the contract price, if the order adopted by the fiscal court, and on which the plaintiff relied, was a valid and binding contract; or, if this order was invalid, then the county should be required to pay the plaintiff for such service its reasonable value.

Section 2055 of the Kentucky Statutes makes it the duty of the fiscal court to fix the compensation of the health officer by allowing to him a salary. The evident purpose and object of the legislature in passing this act was to prevent controversies between the health officer and the fiscal court growing out of questions of this character. But, as it is the plain duty of the county to meet the legitimate and proper expenses of the health officer, when he proceeds in the way and manner as by statute directed, the failure of the fiscal court, in advance of the service rendered, to fix a salary as compensation for the health officer, could not have the effect of defeating him in his effort to collect for such service the reasonable value thereof.

The serious question presented by the record was: Did the health officer act on the direction of the county board of health, or was he acting on his own initiative? The uncontradicted evidence of the plaintiff himself, as well as that of the chairman and another member of the county board of health, showed that a blanket instruction had been given him to look after the sanitary and health conditions of the county, and to take such steps as, in his judgment, were necessary to prevent the spread of contagious and infectious diseases. The record did not show just when this blanket instruction was given. There was no evidence that the record kept by the county board showed that such an instruction was given; but it was unnecessary that there should be a record to this effect. If, in fact, the county board passed such an order, it might be proved by oral evidence. There was no showing that at the time this general authority was [illegible] here was prevalent in the county any contagious dis[illegible] The services rendered by the plaintiff were in two isolated cases. He acquired his knowledge of their existence usually in this way: The physician in attendance would call him up by telephone, or otherwise notify him, that there was, at a certain place, a patient apparently suffering from a contagious disease. The plaintiff would thereupon visit the patient, and, if his diagnosis of the case led him to believe that his informant was correct, he would take the steps proper and necessary to prevent the spread of the disease. When he would thereafter meet members of the county board, he would tell of the way and manner in which he was discharging the duties of his office. On one or two occasions he met as many as two members of the county board of health, physicians, and discussed with them certain cases, which were then being treated by him, and was advised that he was proceeding with the work to the satisfaction of the board. It was apparent from the testimony of the chairman of the board of health that he regarded the law as fully complied with by issuing to the health officer a general instruction to go ahead and look after the sanitary and health conditions of the county; and hence he did not deem it necessary to call a meeting of the board to give explicit directions concerning any particular case; and this undoubtedly was the reason why the board did not meet and take action on the several cases which were treated and looked after by the plaintiff. The county board intrusted to the plaintiff the discharge of the duties which were, by Section 2055, imposed on it. On this showing the court should have directed a verdict for the county.

The county board can, when acting within the jurisdiction conferred on it by statute, bind the county. But the health officer has no such power. He is a mere ministerial officer, a creature of the board, charged and instrusted with the duty of carrying out its orders. His duties are defined and fixed by the statute, and it is only when he acts under the order and direction of the county board that the county is responsible for expenses incurred or made by him. Not only so, but he must have the authority, in each case, in advance of any action on his part looking toward establishing a quarantine, or doing any other act for which a claim is to be made against the county.

Licensed Physician Employing and Aiding Unlicensed Person to Practice Medicine

(Gobin vs. State (Okla.), 131 Pac. R. 546)

The Criminal Court of Appeals of Oklahoma affirms the judgment as to each of the defendants, O. O. Gobin and R. W. Freeman, who were charged with practicing medicine without a license, and convicted, a fine of $250 and sixty days' imprisonment being imposed on each as the punishment. The court says that much testimony was introduced on behalf of the state, but that it was necessary to consider only the testimony introduced by the defendants. Gobin admitted that he had no license to practice medicine in Oklahoma; that he was in the employ of Freeman on a salary; was practicing medicine as the assistant of Freeman; was collecting fees for his services and paying them over to Freeman. Freeman in his defense introduced a certificate from the state board of medical examiners authorizing him to practice medicine and surgery in the state. He testified also that Gobin was in his employ on a salary; that Gobin was practicing medicine under his directions and receiving fees therefor which were turned over to him.

There was no question but that Gobin's conviction was entirely proper, and the judgment as to him should be affirmed. Freeman, however, had the required certificate, and so far as his own acts were concerned independent of Gobin he could not be convicted. On the prosecution of a person charged with violating the medical practices act on the ground that he does not possess an unrevoked, valid certificate from the state board of medical examiners, the production at the trial and the introduction in evidence of such certificate is a complete defense of such charge. This rule, however, is not intended to, and does not, protect such person from prosecution if he aids and abets another to violate the medical practice act in so far as his connection with such other unauthorized person is concerned.

A person who does not possess a valid, unrevoked certificate from the state board of medical examiners is not entitled to practice medicine under the laws of Oklahoma, except in emergencies and such other cases as are specifically exempted by the statute, and this is true even though he works with or under the directions of a duly authorized practitioner; and it is immaterial whether he works for a fee, percentage, or on a salary.

The trial judge instructed the jury that if they found beyond a reasonable doubt that the defendants Freeman and Gobin entered into an agreement by the terms of which Freeman signed up prescriptions in blank to be used by Gobin in his absence, by filling in such prescriptions over the name of Freeman, and prescribing medicines for patients for a compensation, and that pursuant to such agreement between them Freeman did leave prescriptions signed in blank by him for Gobin, and did authorize Gobin to receive patients in his absence and to treat and prescribe for such patients for a compensation, from said patients to Gobin, or to Freeman, or to both Gobin and Freeman, and that Gobin did it, and further found, beyond a reasonable doubt, that Gobin did not have the certificate required by law to practice medicine and surgery, then it would be the duty of the jury to find both Freeman and Gobin guilty, although they should find from the evidence that Freeman did have a valid certificate from the proper state authorities to practice medicine and surgery.

Section 2045 of the Compiled Laws of Oklahoma, 1909, provides that "All persons concerned in the commission of a crime, whether it be a felony or a misdemeanor, or whether they directly committeed the act that constituted the offense or aided and abetted in its commission though not present, are principals." Under this statute, Freeman, if he aided and abetted Gobin in a violation of the medical practices act, would be guilty and subject to punishment, not because he (Freeman) did not have a license to practice, but because Gobin did not have, and because he (Freeman) aided and abetted Gobin in the commission of the offense. It was not contended that Freeman did not know Gobin was without authority to practice medicine in Oklahoma.

The law and instructions of the court properly applied to the facts were such that the jury would not have been warranted in finding Freeman guilty of practicing without a license. But, under the instruction of the court quoted and the facts, the jury was authorized and fully warranted in convicting Freeman of aiding and abeting Gobin in case it found from the facts that Gobin did not have a certificate or license to practice medicine in the state.

The medical practices act does not any more contemplate or authorize a registered physician going out and employing all the unauthorized quacks in the country to aid and assist him for a compensation or otherwise, except in emergencies, in the practice of medicine, than it does the employment for the same purpose of the section hands on a railroad. The law is not only intended to protect legitimate practitioners, but also to protect the public against being imposed on by an incompetent person holding himself out as a physician. The laws of this state were enacted to be observed and enforced and not to be evaded and violated. It is evident from this record that the defendant Freeman was seeking to aid Gobin in evading the law, and in doing so both of them violated it and incurred its penalties.

Circumstances Entitling Physician of One State to Compensation for Services Rendered in Another—Construction of New Jersey Statute—Authority of Wife to Employ Physician for Husband in Hospital—Basis of Compensation—Counterclaim to Mortgage

(Prentice vs. Ladinski (N. Y.), 141 N. Y. Supp. 1005)

A special term of the Supreme Court of New York, New York County, allows compensation to the defendant, a physician and surgeon of New York, for services rendered in New Jersey. The court says that the action was brought by the plaintiff, as trustee in bankruptcy of the estate of one Hayman, bankrupt, to foreclose a mortgage given by the defendant to another party, and by the latter assigned to Mr. Hayman. The defendant set up a counterclaim of $2,500 for medical services rendered to Mr. Hayman in his last illness. Mr. Hayman, harassed by business troubles, had attempted to commit suicide at a hotel in Newark, N. J., whence he was removed to the Newark City Hospital. His wife was communicated with, and she had the defendant summoned, who came to the hospital the same afternoon, which was Sunday, and was thereafter in constant attendance on the patient until Thursday evening. He then was absent from the hospital until Friday morning, and remained until Friday night, when he finally left, having given up hope. The patient died Saturday morning. When Mr. Hayman was first taken to the hospital, which was a public hospital, treating patients without pay, he was put in a public ward with other patients; but after the defendant's arrival he was transferred to a room reserved for special cases, and which he occupied alone. While the rules of the hospital did not permit the defendant formally to take charge of the case, the hospital physicians and surgeons extended to him every courtesy and all the freedom which the rules of the hospital permitted. The defendant was in constant attendance at the bedside of the patient, and his suggestions as to treatment were complied with, and some treatment he himself administered. At his suggestion an operation for transfusion of blood was performed. Another surgeon, also of New York City, was, on the recommendation of the defendant, called in to perform this operation.

The evidence, the court holds, did not warrant the inference which the plaintiff sought to draw that the defendant rendered the services in question as a friend, and not for compensation. The defendant had been Mr. Hayman's physician for years. It was also true that he had been an intimate friend of his. While this circumstance might have had the effect of rendering his professional services to his friend more assiduous and more anxious than they might otherwise have been, it manifestly did not change the character of the services. The failure of the defendant to make any charge on his books for this service and to send a bill for the same had no particular significance, because he knew that the estate was bankrupt, and, as he explained, he did not, until afterward, understand that he was entitled to make a charge for his services as a counterclaim to the mortgage.

The plaintiff also argued that, although a licensed physician of another state not licensed in New Jersey may act as a physician or surgeon in that state if he desires, without rendering himself subject to punishment, yet he may not recover fees for such service. Without quoting and going into an examination at length of the New Jersey statutes on this subject, the court thinks that those statutes were not intended to prevent the recovery of compensation for medical services rendered under such circumstances as those proven in this case.

It seems to the court that the purpose of the New Jersey statute, when read as a whole, is clear, and that it is only those who either reside or sojourn in the state of New Jersey that are subject to the requirements of the act, and that the legislature intentionally left entire freedom to physicians of other states to render professional services within the state of New Jersey in an occasional way, as distinguished from opening an office or appointing a place to meet patients, which latter, it is expressly provided, shall constitute a practitioner a sojourner in the state and subject him to the requirements of the act. It is a matter of common knowledge that great numbers of residents of New York state and Pennsylvania spend a large portion of their summers in New Jersey, and it is quite evident that the legislature of the state of New Jersey meant to leave entire freedom to such residents to call their regular family physicians, or such physicians as they might select from other states, to render them professional service. But whether or not the court is right in its construction of the New Jersey statute, it thinks that this case might, if necessary, be decided irrespective of the New Jersey statute, as the parties were all residents of New York state, the contract was made in that state, and the action was brought in that state.

Passing to the question of the authority of the wife to employ the defendant, the court does not think that in this case there could be any serious question as to such authority. She employed the same physician that her husband had been in the habit of employing for years. It was plain from the evidence that the condition of the patient was so critical that the physician was warranted in remaining in constant attendance. The wife was also at the hospital during the entire time and was aware of the continuous attendance of the physician. It was not incumbent on the wife to send the defendant away, on the theory that the hospital physicians could and would render all the service necessary. The case was a most critical one. If the patient's life was to be saved, the unremitting attention of a skilled physician was called for; and such attention could not, in the nature of things, be received from the hospital physicians, there being between three hundred and four hundred patients at the time in question.

But as to the compensation to be allowed the defendant, the court is in accord with the contention of the plaintiff that, although the evidence showed the defendant to be an operating surgeon of great skill, nevertheless for his attendance on this patient he should be compensated rather on the scale of charges for services of a family physician than the much higher scale of services of an operating surgeon. He performed no operation. The operation that was performed was performed by another surgeon of his selection; he himself being so worn out by his vigil of the night before that he was not in condition to perform it. The testimony of the numerous medical experts as to the value of the services rendered varied widely. On consideration of all that testimony and of all the facts in the case, the court fixes the compensation for such services at the sum of $750, to be deducted from the amount remaining unpaid on the mortgage.

Society Proceedings

SEVENTEENTH INTERNATIONAL MEDICAL CONGRESS

August 6-12, 1913

(From Our Regular and Special London Correspondents)

(Continued from page 701)

Section on Surgery

Sir W. Watson Cheyne presided at the first meeting (Wednesday, August 6) of the Section on Surgery in the Physics Theater of the Imperial College. He was supported on the rostrum by the Secretaries of the Section, Mr. D'Arcy Power, Mr. Raymond Johnson, Professor Thorburn, Professor Sinclair, while on the benches many of the most distinguished surgeons of the day were seen, among them Professor Lucas-Championnière and Professor Hartmann of Paris, Professor Freiherr v. Eiselsberg of Vienna, Professor Dollinger of Budapest, Sir William Macewen of Glasgow and Professor Oskar Bloch of Copenhagen.

The President's first word was one of welcome. He could not help, he said, contrasting the condition and scope of surgical science of the present day with that of a generation ago when the Congress last met in London in 1881. That date seemed to him to mark the close of the old régime and the introduction of the new. The men who had laid the foundations of the great superstructure of surgery were no longer with them. And they were still mourning the loss of Lister, the greatest genius in surgery, the man whose work and love for humanity had brought light and health and rejoicing to countless homes. Surgery had far outstripped medicine in the progress of her art. But he would not like to say what new developments might not open up to medicine, so that in another thirty years' time the relative positions might be reversed. At present they removed large portions of the body to cure disease, but that could only be justified till such time arrived when disease would be cured by other means developed along the lines of serum and vaccine therapy.

Professor Lucas-Championnière followed with a warm-hearted, eloquent tribute to the memory of Lister. Professor Freiherr v. Eiselsberg and Dr. Oskar Bloch spoke also in the same strain.

Dr. G. Le Filliâtre of Paris read the first paper on spinal analgesia. He presented statistics of 116 cases of patients in a very weakly or cachetic condition on whom he had operated with the aid of spinal analgesia in lesions of the head, neck, thorax, stomach, liver, kidneys and lower limbs. In every case the anesthesia was perfect, and in those cases which for the most part could not otherwise have received the benefit of surgery the operative mortality was only 3.5 per cent. The author concluded that operative shock was nothing more nor less than shock due to general narcosis by chloroform or ether and that shock disappeared with his method of producing analgesia and the mortality sank almost to nil in these extremely feeble patients.

This question was discussed by Professor Dollinger (Budapest) who advocated local anesthesia preceded by morphin, and who had performed cholecystectomy six times by this method, by Prof. von Eiselsberg (Vienna) whose preference was for general anesthesia in children, and by Professor Hartmann (Paris) who was totally in favor of general anesthesia, especially in abdominal work.

Surgery of Gastro-Intestinal Conditions

Mr. Herbert J. Paterson (London) in a paper on "The Physiology of Gastrojejunostomy" presented arguments in favor of regarding the benefits which follow gastro-enterostomy as due to physiologic processes and not merely to mechanical drainage, which were supported by statistics of gastric analyses. He concluded that a certain amount of bile and pancreatic juice entered the stomach after this operation, that the total acidity of the gastric contents was diminished by 30 per cent., that gastric digestion was impaired but not lost after the operation, and that the mobility was unaltered except in pyloric stenosis. He thought that occlusion of the pylorus was an unnecessary complication of gastrojejunostomy, and that excision of simple ulcers was not required, and further, in his view it was contrary to clinical experience that malignant degeneration of gastric ulcers was frequent after gastro-enterostomy.

"Pancreatitis and a New Factor in Its Causation," was the title of an original contribution by Dr. E. Archibald (Montreal). Clinically he had observed that when a gall-stone occupied the ampulla of Vater bile was dammed back and could force its way up the pancreatic duct. Before this could happen it necessarily must overcome the restraining action of the sphincter at the outlet of the duct of Wirsung. He had made some experiments to find out how much pressure was required to accomplish this and found that generally a pressure five or six times greater than the ordinary bile pressure sufficed. In a case of pancreatic cyst in the clinic of Dr. Armstrong of Montreal he had examined the fluid and found bile. The keynote, therefore, of the treatment of certain forms of pancreatitis was not drainage affecting the pancreas or its duct, but reduction of the excessive pressure in the biliary system by cholecystostomy. He suggested that a proper operation for certain cases of chronic and subacute recurrent pancreatitis would be cutting this sphincter in the ampulla.

Dr. L. Mayer (Brussels) in a short paper on the subject urged the advisability of more extended employment of transverse incisions in abdominal work.

In the absence of Dr. Russell S. Fowler (New York) his communication on the "Elevated Head and Trunk Position in the Surgical Treatment of Abdominal Lesions" was read by Dr. Polak (Brooklyn). The paper narrated the circumstances under which this now well-known therapeutic measure was discovered and detailed the anatomic and mechanical basis on which it was founded. He was still convinced that it contributed largely to the lowering of the death-rate, but he had no new facts or theories to offer.

Nor was there much that was new in the contribution of Dr. Waters F. Burrows (New York) on "Postoperative Intestinal Stasis" and the intra-abdominal use of oil. This measure has been known to surgeons for over two years and was suggested by Dr. D. P. D. Wilkie at the meeting of the British Medical Association in 1911 as a means of preventing the formation of adhesions in acute septic peritonitis. Dr. Burrows held that apart from the gross complications which might occur after an abdominal operation there were sometimes symptoms of obstruction which he thought were associated with regional or segmental gut spasm. This spasm occurred mostly in the small intestine and probably it could be referred to more or less minute traumatism arising in the manipulations of the operation. The evil effects of these abrasions could be combated by pouring about 6 or 8 ounces of "oleum petrolatum" into the abdominal cavity so that a coating of oil would prevent adhesions and promote the normal peristaltic movements. He had carried out a series of experiments to show the harmlessness and value of neutral mineral oil so used.

Professor Krynski (Warsaw) presented notes of a case which induced him to argue for the recognition of cirrhosis of the mesentery as a clinical entity. The patient had suffered for twenty-two years with abdominal pain, irregular attacks of constipation and diarrhea, great increase in size of the abdomen, and palpable tumor. Ileocolostomy resulted in great improvement. The condition was a chronic inflammatory process; a fibrosis characterized by superabundant development of connective tissue and loss of fatty and elastic tissues.

The second meeting of the section (Thursday, August 7) was devoted to "Discussion of the Operative Treatment of Malignant Disease of the Large Intestine, Exclusive of the Rectum," the essayists being Professor Rafaele Bastianelli of Rome and Professor Körte of Berlin. Professor Körte's paper was an elaborate study of the subject, replete with historical references and statistics drawn from all sources. The particular dangers of resection of the large intestine for malignant tumors, collapse and peritonitis, depended chiefly on the anatomic relationships of the resected portion of the bowel as well as on the difficulty of preventing soiling of the peritoneum. In acute intestinal obstruction it was possible only to adopt a simple procedure for emptying the bowel, namely, colostomy, with the intention of going on to perform a secondary radical operation in two or three stages.

In chronic slowing of the intestinal flow the two or three-stage operation by suture (colostomy, resection of the tumor, closure of the colostomy) was the most certain operation, though the slower method. Where it was possible to thoroughly empty the bowel, insure perfect hemostasis and absence of tension of the sutured bowel-ends, the one-stage resection and suture was best. The various anatomic relations of different portions of the great intestine demanded various operative procedures. The expectation of long-standing healing was relatively favorable in carcinoma of the great intestine. As regards palliative operations, entero-anastomosis in the absence of obstruction was the best operation. Colostomy, and that may mean cecostomy, was the method of choice where obstruction existed. Colectomy or entero-anastomosis was to be performed secondarily to emptying of the bowel.

Professor Bastianelli (who spoke in English) said that surgeons should adhere to the principle of not interfering with the primary tumor if obstruction existed. Only in some cases of tumor of the cecum was it possible to risk violating that principle, and mainly because an artificial anus in the cecal region was highly objectionable. But in the case of a left-sided tumor, formation of the cecal anus was the operation of choice. He had never seen exhaustion result from the existence of an artificial anus. The ideal operation was primary excision of the tumor in one stage; it certainly was the operation of choice in right-sided tumors, and was applicable in all except tumors situated low on the left side where primary suture was practically impossible. The removal must be thorough and must include not merely a large portion of adjacent bowel, but the lymphatic apparatus as well. The death-rate in right-sided tumors was 9 per cent., and the left side 15 per cent. Modern technic could not bring about great improvement in the results of palliative operations; these results really had nothing to do with the operation itself, but depended on the patients's condition. As to radical operation, the principle must be strictly adhered to not to attempt it in the presence of complications. The comparatively slow growth of the neoplasm with its late lymphatic and visceral dissemination and the possibility of earlier diagnosis were important factors to consider.

Dr. A. L. Soresi (New York) demonstrated a method of end-to-end suture of the bowel which simplified the operation and permitted it to be accomplished by means of only one row of sutures. But as it appeared to require the employment of a piece of rubber tubing which was left in the lumen it was not regarded by some members of the section as an advance.

Statistics were contributed by Sir Frederic Eve (London). He was of the opinion that unless the local and general conditions for primary resection were distinctly favorable the average operator—in the London Hospital sixteen surgeons in all werre responsible for the work—would best consult the safety of the patient by doing the three-stage operation. The mortality had not increased since the extensive modern radical operations came into vogue; the mortality of resection with small margin of healthy bowel was 52.5 per cent., whereas the extensive operations of the Jamieson and Robson type had a mortality of only 29 per cent.

Mr. Charters Symonds suggested that resection should be performed even in the presence of metastasis in the liver provided it were not extensive and instanced a case in point in which a patient lived for nearly two years after resection even though there was a small metastatic deposit visible in the liver. Similarly in the anemia found in such cases he thought it might be sometimes advisable to remove the original tumor and he had known the anemia to disappear completely after so doing.

Appendicostomy in preference to cecostomy in irremovable cancers was urged by Mr. W. G. Spencer (London). He held that if a large catheter (14 English) were introduced through the appendix into the cecum in such a way that fluid could be run in and fecal fluid siphoned off, it was a sufficient and a more suitable mode of treatment than the artificial anus. He did not believe that the regular passage of feces irritated a cancer of the colon.

Short contributions to the debate were made also by Mr. H. J. Paterson (London), Prof. A. E. Barker (London), Professor Krynski (Warsaw), Dr. Keppich (Budapest), Dr. J. B. Murphy (Chicago), Professor Hartmann (Paris) and the essayists replied.

Professor Bastianelli held that the one-stage operation was the ideal one; there was a technical as well as a clinical ideal to be sought. Very extensive operations were sometimes easier to do than limited ones as then the bowel could be brought outside the wound in the abdominal wall. Whether the pathologists were right or not, in regarding distant permeation as the rule, he favored operations of wide scope. He associated himself with Professor Körte in hoping for earlier diagnosis, but meanwhile early diagnosis was difficult and problematic.

At the afternoon session of August 7 Dr. Angelo Chiasserini (Rome) read a paper on "Experimental Inflammatory Lesions of the Hypophysis and of the Hypophyseal Region." The experiments were performed on dogs and were carried out by inoculating that region with tuberculous material and with sporotrichosis. The result of his investigations was to show that quite definite inflammatory changes took place.

Dr. F. H. Albee (New York) gave an account of 175 cases of transplantation of bone, the grafts being taken from the tibia. Of these cases 145 were cases of spinal curvature. His work is well known in the United States.

Dr. J. B. Murphy (Chicago) then gave a lantern demonstration of the clinical results attained in "Arthroplasty and Osteoplasty." His work is familiar to the profession in the United States.

Dr. H. Eckstein (Berlin) gave a lantern demonstration of the results he had been achieving in the rectification of nasal defects. The ordinary type of saddle-nose could be readily treated by injection of hard paraffin and he was also able in many cases to make good the loss of the tip of the nose by similar injection. Dr. Stein (Wiesbaden) criticized the employment of hard paraffin and held that soft paraffin was less likely to give rise to embolism and thrombosis.

The last paper for the day was read by the secretary on behalf of Prof. R. Minervini (Naples). He advocated the employment, where possible, of whole skin grafts taken from newly-born babies who had died within a few hours after birth. He was able in five cases to make excellent use of large grafts obtained in this way.

Discussion on Renal and Vesical Tuberculosis

The fourth session (Friday, August 8) of the Surgical Section consisted of a joint meeting with the Section of Urology to discuss "The Diagnosis and Treatment of Early Renal and Vesical Tuberculosis." Professor Rochet of Lyons and Dr. Hans Wildbolz of Berne were the essayists.

Professor Rochet deprecated any attempt to formulate definite and precise rules in a question so delicate and so diversely regarded by acknowledged authorities. In regard to unilateral kidney tuberculosis a "granular" lesion discrete and not deeply placed seemed inevitably to go on to an ulcerating and caseating stage with fatal termination, but there was no proof that this early condition did not, as in other organs, heal. The diagnosis of this early granuloma, not yet ulcerocaseous, was obscure and difficult. In a patient suspected to suffer from early tuberculous disease and in whom the urine from one kidney contained bacilli with positive inoculation of guinea-pig he would not advise immediate operation, but would wait for three new conditions to develop: (1) a slight degree of pyuria, (2) a certain diminution of the functional value of the diseased kidney, and (3) such complications as serious repeated hemorrhages, pyrexia, anemia and bladder symptoms. Whenever symptoms pointed to formation of ulcer or caseation, operation was called for. As to specific treatment by tuberculins, antituberculosis serums and immunizing substances, he had to admit that his experience was limited, though he did not think they could do all that was claimed for them. The treatment by the immune bodies of Spengler he did employ in the expectant period, and he thought with some success. These bodies are obtained by extraction from red blood-cells of rabbits immunized to tuberculosis.

In bilateral kidney tuberculosis the lesions were probably not equal on both sides. In these conditions specific treatment was indicated.

Early tuberculous infection of the bladder in so far as it was almost inevitably due to secondary infection from the kidney (90 to 95 per cent.) was cured when the kidney was treated. In treatment of bladder disease persisting after nephrectomy, or in the few cases of primary infection or after infection from the genital organs, he advocated washing the bladder with creosote solution and administration of pills composed of iodoform, arsenate of soda and creosote. Specific treatment could be used only in cases in which vesical infection was associated with advanced renal and genital disease.

Dr. Hans Wildbolz observed that early tuberculosis did not refer simply to the patient's first symptoms, as he had known cases to be tolerably advanced before the patient sought advice. He had found a kidney three parts cavernous in a patient who for only ten days had complained of urinary symptoms. In over 300 cases of tuberculous kidney examined by him only twenty-five were in the early stage; in all the others the disease was advanced. He indicated some symptoms which drove the patient in the early stages to his physician—disturbance of general health, lessened vigor and ability for work; local signs referred in more than two-thirds of the cases to the bladder (Rafin) (43 per cent. of his own cases complained of cystitis); kidney pain of dull or occasionally neuralgic character; frequency of micturition, sometimes incontinence; pain in the bladder even before that organ became infected; hematuria, a common early sign (out of 300 cases he found it only twice as the first symptom), was sometimes very severe. Then the urologist was able for himself to observe persistent slight albuminuria, polyuria, alternations in blood-pressure (it was necessary to exclude chronic nephritis in which polyuria and albuminuria were also found), acidity of the urine, pyuria, cystoscopic examination (often negative, though he had observed redness and infiltration of mucous membrane not specifically tuberculous). In 70 to 80 per cent. of all cases tubercle bacilli were found in centrifugalized urine, but inoculation experiment was the surest test. It had to be kept in mind that tuberculous bacilluria had been found in cases of phthisis in which neither kidney, bladder nor genital organs were infected.

The diagnosis of tuberculous disease of the kidney with present-day methods could be made with certainty only when pus cells and bacilli were found in the urine of that kidney whose function was unmistakably though slightly disturbed.

Tuberculin treatment in the early stage had had more claims put forward on its behalf than any other. But it seemed to him that for only very few recorded cases could the claim of permanent cure be sustained. He gave his own experience of thirteen carefully observed cases in which treatment had been conducted for from one to four years, and his conclusion was that not a single one of them could be said to be cured, and eight later required nephrectomy. The results of early nephrectomy seemed good on the whole, but the cases were too few to found conclusions on. He believed, however, that as soon as unilateral tuberculous disease of kidney was with certainty diagnosed, that kidney should be removed.

Dr. A. Fullerton (Belfast) pointed out that the disease might progress rapidly so as in a few weeks to render the patient's life intolerable or it might go on for ten years with but little disturbance. Hope of spontaneous cure was not to be relied on. He had had only three cases of primary disease of the bladder. The absence of pus and albumin were not absolute proof of the integrity of the kidney. Tubercle bacilli were found in 80 per cent.; frequent examinations for the bacillus were necessary. The cystoscope and ureteral catheter were the most important instruments of diagnosis. Removal of the affected kidney was the only absolute cure.

Professor Kümmel (Hamburg) had had 60 per cent. cures after nephrectomy. Tuberculin was on the whole a dangerous form of treatment because it raised false hopes on account of the undoubted improvement following its use in the first weeks or months.

Dr. Van Houten (The Hague) treated bladder infection (which was always secondary to kidney disease) with silver nitrate solution, ½ to 2 per cent., injected once weekly.

Mr. Leedham-Green (Birmingham) was of opinion that the only cure was removal of the diseased organ. But he was doubtful if early tuberculous infection did not sometimes heal spontaneously, as it did in other parts. So long as the function of the kidney was unimpaired he would not remove it. Clinically it was difficult to estimate the stage of the disease. In children their attitude should be one of extreme caution because in them he had found tuberculous bacilluria with few pus cells or none and good functionating kidneys.

Dr. David Newman (Glasgow) demonstrated by the projectoscope the cystoscopic appearances in early renal and vesical tuberculosis. He pointed out that the most characteristic feature of the symptoms (polyuria, slight pyuria and albuminuria, occasional hematuria) was their tendency to remission, and in that lay a serious danger in so far as both patient and doctor were deceived. The premonitory symptoms of tuberculosis could appear long before the development of a gross renal lesion. In this stage cystoscopy frequently applied, and harmless as it was, was most successfully employed. When a kidney was tuberculous the orifice of the corresponding ureter indicated the nature of the lesion by changes in the color and contour of the lips of the orifice, by the size, frequency and regularity of the "shoots" of urine and by the character of the urine which escaped. His conclusions in primary renal tuberculosis were: 1. When the ureteral orifice was normal no serious disease existed in corresponding kidney. 2. When the kidney was normal the orifice of the ureter also was normal. 3. Evidence of tuberculosis at orifice was associated with tuberculosis of corresponding kidney. 4. In tuberculosis of bladder the ureter did not become involved if corresponding kidney were free from disease.

Professor Rovsing (Copenhagen) was doubtful of the possibilities of early diagnosis, and thought that these very early cases rarely came to the surgeon. After removal of the tuberculous kidney, the tuberculous bladder quickly recovered; to assist it he injects 6 per cent. carbolic acid. The efficacy of tuberculin seemed to him so problematical that its use should be limited to inoperable cases.

Mr. Hurry Fenwick (London) held that early cases of kidney mischief were diagnosable by the cystoscope. Even only three weeks after onset of symptoms he had found thickened ureter and intravesical signs. He had used tuberculin constantly for fifteen years in small doses and found that the patient's general condition improved nearly always. He believed it acted as a tonic. Our knowledge of this disease was to come from study of its progress in the female patient. Nephrectomy was a perfectly safe operation if performed with rigorous asepsis; the mortality need not be over 3 per cent.

Surgery of the Arteries

The chief subject for discussion Saturday, August 9, was "The Surgery of the Arterial System." Prof. Rudolph Matas, New Orleans, made a rapid survey of the whole range of the new movement in surgery, described the suture of both arteries and veins, arteriovenous anastomosis of various kinds, transplantation of arteries and veins and brought forward laboratory as well as clinical evidence to show the feasibility of these various procedures. In regard to vascular implantation of arteries and veins autogenetic methods were more suitable than heterogenetic though these were not wanting in success. The segment of an artery or vein could be grafted to another, or branches of a parent trunk could be reimplanted on the same vessel at different levels. Arteries and veins could be patched with portions of blood-vessels or other material. The main portion of his paper was devoted to the method of treating aneurysm by suture associated with his name—intrasaccular suture or endo-aneurysmorrhaphy. The latest statistics included an analysis of 215 reported cases. The results fully justified the confidence placed in this operation.

Dr. C. A. Ballance recognized that surgery of blood-vessels had advanced greatly. He specially spoke of the obliterative and reconstructive treatment of aneurysms recommended by Matas and thought that since Hunter no advance had been made till Matas began his work. In his own view, except in the treatment of aneurysm of the aorta and some other great vessels, and in special circumstances, Matas' method was not likely to find general acceptance. He regarded popliteal aneurysm as the type best suited for Matas' operation. But nevertheless the practical advantages and the extreme simplicity of the Hunterian operation seemed to him still to prevail. He thought the Hunterian operation for popliteal aneurysm was the greatest advance in surgery ever made by the single act of one man. Matas' operation should be reserved for those cases in which the older operation is inapplicable.

Dr. A. L. Soresi of New York showed his apparatus for suture of blood-vessels. He had had made a small clamp which held the ends of the vessels to be joined in such a way that minute hooks held back a cuff so as to expose the intima all around. Then intima was sutured to intima by the insertion of very small gold wire clamps after the fashion of Michael's clamps. A single row of these was enough to effect a complete and safe junction.

Dr. Davis (Brussels) said that Professor Oppel of St. Petersburg had said that ligation of both artery and corresponding vein gave a better final circulation than ligature of the artery alone. The principle was sound but on one condition only, that the vein should be tied *after* the occlusion of the artery. He had proved the efficacy of the method and the truth of the principle by some experiments.

Dr. Ernest Jeger (Berlin) gave a short account of some of his studies. Eck's fistula or anastomosis between portal vein and inferior vena cava he had performed repeatedly on dogs. Magnesium tubes were a useful support to blood-vessels in suturing, as the magnesium afterward became absorbed. He demonstrated specimens of transplanted kidneys from their normal situation to the neck, the carotid artery being joined to the renal artery and the jugular vein to the renal vein. He had even inserted one end of a piece of vein into the left ventricle of the heart and the other into the aorta, so that the aortic valve was put out of use. Most of these experiments were performed on animals, but he was hopeful that in time they will become applicable to the human subject.

The experience of Dr. V. Soubbotitch with traumatic aneurysms in the Balkan War was interesting. The majority of the cases had to be treated by the older methods, but in some cases he and his colleagues were able to suture arteries and veins with moderately good results.

Dr. Chiasserini (Rome) had performed thirteen experiments in transplanting flaps of fascia lata in repairing the aorta or other large vessels with such success that he recommended that tissue as very suitable for the purpose.

Discussion on Brain Tumors

The largest and most representative meeting of the Section was that which met Monday, August 11, for the discussion on "The Diagnosis and Treatment of Tumors of the Brain." The essayists were Professor von Bruns, Professor Freiherr von Eiselsberg and Dr. H. H. Tooth.

Professor von Bruns showed that operative procedures for cerebral tumors fell into two groups: (a) radical operations with extirpation of the tumor, (b) palliative operations for the relief of pressure, and these could be either primary and devised for that purpose alone, or they were performed as a scondary resort when the radical operation for some reason could not be performed.

The indications for the radical operations and the prognosis of those operations depended on three things: (a) the nature of the tumor; (b) the possibility of certain general and local diagnosis; (c) the accessibility of the tumor. Inaccessible were tumors of the third ventricle and many in the substance of the hemisphere. All others were accessible, but with very different degrees of danger.

Professor von Eiselsberg spoke of the great difficulties in operating on tumors of the hypophysis. He had tried to attack these tumors by the nasal route, but thought the risk of operating through a passage not absolutely aseptic was great. He showed several specimens and pictures of cases operated on. He strongly advocated early operation and held that it was inhuman not to operate on brain tumors.

Dr. Howard H. Tooth's report concerned itself with the question of results of surgical treatment. A high mortality was inevitable at the best. They were not to be dismayed by it nor relax efforts to relieve patients. In frontal tumors where removal of tumor partial or complete was done he found that in glioma the average postoperative survival period was ten months; in endotheliomas which pressed on but did not infiltrate the brain and which could be removed without great difficulty the mortality was 46.6 per cent. In tumors of the central region comprising 65 cases of glioma, sarcoma and carcinoma, the average postoperative survival period was ten months. The percentage of recoveries in endotheliomas was 66.6. There were only a few cerebellar cases, with four recoveries. Two tuberculoma patients died within two months though the growth was completely removed. Decompression by craniectomy in one or two stages was followed by an appreciable lowering of pressure. From his tables he could draw no conclusion for or against the method.

Prof. Harvey Cushing said that the relief obtained after decompression in a relatively silent area might be great. Many tumors were slow in growth and might reach a large size before disturbance took place. If a very strict interpretation of the recovery was taken, none would see more than 5 per cent. recoveries. But if the patient obtained after the operation freedom from discomforts, preservation of vision, prolongation of life, then the percentage of recoveries rose to 50 or 60. There could be no doubt that 10 per cent. would succumb after operation, even after such a simple proceeding as decompression. In the last 100 consecutive cases he found that seven deaths could be attributed to the operation. In 350 tumor cases need for operation was certified in 200; 40 per cent. were gliomas, 30 per cent. arose from glandular structures. In true endotheliomas there was none of the cellular fibrillae seen in gliomas; they were potato-like tumors which had point of origin from the dura. Two cases of enormous tumors had no pressure symptoms and no ocular fundi changes. He had had twenty-four operations for tumors in the lateral recess of the cerebellum. To reach that area he strongly advocated the large crossbow incision with, if necessary, removal of posterior half of foramen magnum. This permits exposure of the medulla, and if respiratory difficulties arose he had removed the posterior portion of the atlas while artificial respiration was being carried on with restoration of respiration.

He thought they must operate slowly in these cases with complete hemostasis. His operations sometimes lasted four hours and they often had to be done in three or four stages. Extremely delicate manipulation was necessary with the greatest possible respect for brain tissue.

Sir Victor Horsley thought accurate histologic diagnosis of tumors was most important. Earlier diagnosis meant earlier operation. He blamed the writers of text-books for their too rigid insistence on recognition of the three great classical signs, headache, vomiting and optic neuritis. These appeared late. They were end-results and the patient ought never to have reached the stage when these appeared; often by that time the tumor was irremovable and decompression only was feasible. Optic neuritis was a most valuable sign. He agreed with von Bruns in recognizing the difference between a radical and a palliative operation and held that operation might be done for differential diagnosis. In palliative operations he deprecated opening the dura, as a rule.

Professor Krause (Berlin) had operated by local anesthesia. He showed pictures of angioma of the brain, and endothelioma growing from the dura. Professor Claude (Paris) was strongly in favor of decompression to relieve symptoms. Sir William MacEwen said that the principal factors in his experience were the necessity for early diagnosis and localization. Wherever physiologists made certain of special points which bore on localization surgeons were able to go in at the part and remove the tumor. Early diagnosis and early operation went together. The classical symptoms were stated too positively, for sometimes a tumor was present even in the absence of classical symptoms. He had found a large tumor and removed it successfully where the only signs were slight paresis of the right arm and contraction of left pupil. In the motor area localization was definite and complete, but in other regions it was not so. Word-blindness, mind-blindness and word-deafness were symptoms which ought to be localizing symptoms and he had successfully operated where these symptoms were present. He had no great belief in statistics.

Professor L. M. Poussepp (St. Petersburg) had operated on thirty-one patients with brain tumor; sixteen cerebellar and fifteen cerebral. His general opinion was that success was not so much a matter of surgical technic as of precision in diagnosis, which could only be obtained by continued study of surgical neuropathology.

Dr. Byrom Bramwell (Edinburgh) thought that there were very few cases of intracranial tumor which could be completely and successfully removed by the surgeon. The whole matter turned on what they meant by recovery. If the tumor were removed and the patient left hemiplegic or blind he had not recovered at all. His pathologic experience convinced him years ago that the surgeon could do little or nothing and he had not seen reason to change from that opinion. He was, however, greatly impressed by the value of the right-sided decompression operation.

Discussion on Intrathoracic Surgery

Tuesday, August 12, Professor Sauerbruch reported on the "Present State of Intrathoracic Surgery." The factors which had been of most importance in the development of surgery of the chest, were, in the main, three: The improvement of diagnosis by means of Roentgen rays; by this method changes in the lung substance, the formation of cavities, the presence of tumor, and the stages of tuberculous disease could be demonstrated, and the alterations and improvements following treatment could be traced. He placed next the experimental researches on pneumothorax. The last factor was the introduction of methods to determine the difference of pressure within the lung in relation to atmospheric pressure.

His own experience was that operations on lungs were best performed by the aid of special apparatus to establish a negative pressure, that is, that the operator and the whole of the patient, except his head, were in a chamber whose pressure was less than the atmospheric pressure, so that collapse of lung did not occur when the pleural cavity was opened. The same object was attained in the reverse manner by making the patient breathe in a small chamber whose internal pressure was higher than atmospheric pressure; this was known as positive pressure. By these methods exploratory opening of the chest cavity was as simple an operation as exploratory opening of the abdominal cavity, and tumors could be removed.

Bronchiectasis was treated by opening into the lung cavity, and drainage. He had cut the phrenic nerve, and performed artificial pneumothorax for the purpose of putting the affected lung at rest. In tuberculous disease of lung he had performed Freund's operation of cutting the costal cartilages of some ribs to permit immobilization of the lung, and had also endeavored to bring about the same object by artificial pneumothorax, thereby causing collapse of the lung. He gave statistics of his work.

In Zurich hospitals in 1910-1913 he had operated on eighty-three cases of lung disease.

Professor Tuffier's report was read in his absence by Dr. Caillard. The ground was similar to that by Professor Sauerbruch.

Sir William MacEwen demonstrated a patient operated on by him eighteen years ago, whose left lung had been removed in its entirety for tuberculous disease. The patient was a strong, healthy-looking man whose left side was hollow and fallen in. He was engaged steadily at work. At the time of the operation the right lung was diseased, but the removal of the hopelessly diseased lung was followed by improvement in the condition of the remaining lung. That experience had been found in four similar cases. In all these cases the apex of the diseased lung had been adherent to the great vein at the root of the neck, and at a later stage in the last four cases the vein and that piece of lung were removed.

Sir William MacEwen's second point was with regard to the differential pressure theories and apparatus of Sauerbruch and others. His belief was opposed to theirs that all these elaborate apparatus were necessary. It was not atmospheric pressure which held together the two surfaces of the pleura, the lung surface and the inner lining of the chest wall. He attempted to demonstrate this by suitable apparatus. He had consulted the late Lord Kelvin, and he had recognized that it was a much greater force, which he suggested should be called "molecular cohesion." Professor MacEwen proved to the Section by an experiment on the table that atmospheric pressure did not hold together two pieces of glass of uniform smooth surface. He believed that the pleural surfaces were held together by molecular cohesion, and that so long as the opening in the pleural cavity was patent to the atmosphere the collapse of the whole lung will not take place. In regard to cancer of the lung, he had given patients great relief by opening into the lung cavity, clearing out the pus and broken-down lung substance and allowing the cavity to close by granulations. He had not cured the cancer, but the patient's death was easier.

Mr. Morriston Davies (London) had performed artificial pneumothorax for phthisis by collapsing the lung and also immobilization of the ribs for the purpose of keeping the lung at rest in phthisis. He advocated strongly frequent and repeated radioscopic examination.

Dr. Meltzer and Dr. Charles Elsberg of New York, Mr. G. E. Gask of London and Dr. Davis of Brussels all demonstrated methods of anesthesia to be employed in operations on the lungs. All except the last were for purposes of intratracheal insufflation. Dr. Meltzer was the pioneer in this form of anesthesia.

Section on Diseases of Children

The President, Dr. Eustace Smith, opened the work of the section Thursday, August 7, by a short address. After extending a welcome to the visitors he referred to the very special character of diseases as they occurred in children, and traced the growth of pediatrics as a special subject. He concluded by expressing a hope that the new methods which had been introduced would not lead to a neglect of those older methods which had already proved useful.

The special discussion of the day was introduced by Dr. V. Ménard of Berck-sur-Mer and dealt with the "Treatment of Tuberculosis in Childhood from the Surgical Point of View," with special reference to bones, joints and lymph-nodes. He thought from the standpoint of local treatment tuberculous osteitis should be separated from tuberculous disease affecting the bones and joints. The local treatment indicated in arthritis was the conservative method, which was almost always efficient if persevered in. Surgical interference was required in suppuration; as the result of associated accidental infections when the disease affected particular joints. Such an operation was drainage or a form of resection which was really drainage on a large scale. The fatality of operative procedure was very small except in the case of hip-joint disease, but here it formed no contra-indication, for it was necessary to save life. The results of operation were good if the after-care was rational and persevering. In spite of the improvement of medical treatment in disease of the lymph-nodes there still remained a part for surgery to play in this condition to free the patient quickly from large masses of lymph-nodes. Whether operated on or not the patient could only recover if placed under favorable conditions for a long time.

Mr. Harold J. Stiles (Edinburgh) continuing the discussion spoke especially of prophylactic treatment and referred to recent work in Edinburgh in this direction. He thought that Koch and his disciples committed a serious error when they minimized the importance of milk as a source of infection in children. Mr. John Fraser had undertaken a research as regards bone and joint cases in the laboratory of the Royal College of Physicians of Edinburgh. His results were of extreme significance. Of the seventy cases investigated, thirty were cases of joint disease and thirty-one of bone disease. Of the seventy cases the bovine bacillus was present in forty-one, the human bacillus in twenty-six and both types in three. All the patients but three were under 12 years of age. It was interesting that in each of the three adults the bacillus was of the human type. Forty-one of the children were under 4 years of age, and in these, in no less than 78 per cent., the disease was due to the bovine bacillus. This bacillus was the organism found in all the children less than 12 months old, and each of these had been entirely nourished on cows' milk. In none of the children artificially fed had the milk been sterilized. Dr. A. P. Mitchell had worked on the etiology of tuberculous diseases of the cervical lymph-nodes. He had investigated seventy-two consecutive cases of lymph-nodes operated on at the Royal Edinburgh Hospital for Sick Children. In nearly all the cases the disease involved the upper carotid set of deep cervical lymph-nodes. Of the seventy-two cases it was found that sixty-five, or 90 per cent., contained the bovine bacillus, and only seven, or 10 per cent., the human form. Thirty-eight occurred in children under 5 years of age. Of these all but three were bovine. Out of sixty-five children infected with the bovine bacillus there was not a single case in which a history of pulmonary tuberculosis could be obtained in the family. There were only three instances in which a history of pulmonary tuberculosis could be obtained in the parents, and in each of these three it was the human form of bacillus which was isolated from the cervical lymph-nodes. Dr. Mitchell's investigations revealed a much larger percentage (practically a third of the cases) of primary tuberculosis of the tonsil than had hitherto been recorded. It was to be hoped that as the result of these investigations the medical profession would realize its responsibility and by educating public opinion bring pressure to bear on the government and the public health authorities to take effective measures to stamp out bovine tuberculosis among dairy cows. He (Dr. Stiles) thought that tuberculosis of the lungs in adults was usually the result of infection through the respiratory tract, while in children tuberculous infection was usually through the alimentary tract. It was very important that the milk should be sterilized which was used for the artificial feeding of infants unless it could be guaranteed free from tubercle bacilli, and that sterilization should be employed also in all households where the children drink milk.

Among those who took part in the discussion which followed were Prof. von Pirquet, Professor Tedeschi, Dr. Andrieux, Dr. Comby, Dr. d'Oelsnitz, Dr. Treplin, Dr. Binney, Dr. Koplik and Dr. Nordheim.

In the afternoon Dr. David B. Lees (London) dealt with the diagnosis of early pulmonary tuberculosis in children. He emphasized the virtue of careful methods of percussion, pointing out that such examination was all the more important in children, since as a rule, no sputum was obtainable.

Dr. P. von Pee of Verviers spoke of the value of "orthopercussion" as described by Goldscheider and by Curschmann and Schlager. It was based on the following principles: (1) the percussion should be as gentle as possible so that the sound could only just be heard; (2) as small an area as possible should be percussed, by application to the chest, not of the terminal phalanx, but by the end of the finger placed vertically in the position of Plesch; (3) percussion should be made with the pleximeter finger parallel with the midline of the body. He examined symmetrically the following regions: (a) the area between the two sites or insertion of the sternomastoid muscle; (b) the subclavicular triangle; (c) the area outside the subclavicular region; (d) the area of the manubrium sterni and the sternoclavicular articulation. The diagnosis of pulmonary tuberculosis in the newly-born was always difficult, and as it had been shown that the tuberculin tests gave a positive result more frequently as age advanced, the difficulty became worse. Seeing the frequency of a positive reaction to the bacterial test it was important to give to ordinary clinical methods the credit which was their due.

Dr. d'Oelsnitz (Nice) spoke of the diagnosis of disease of the thorax by means of radiography. In the discussion which followed these papers Dr. Lapage supported Dr. Lee's contention as to the value of Roentgen rays in the early diagnosis of tuberculosis in children. He thought that the earliest signs were to be found at the roots and not at the apices.

Dr. Findlay (Glasgow) read a paper on the portal of entry of tubercle bacilli. He had by means of special technic been able to inject bacilli into the stomach without insufflating the lungs. The difficulty in avoiding this latter had rendered much former work valueless. The results of his experiments went to show that infection did not occur through the intestine in the absence of a local lesion.

Dr. Coit, Newark (U. S. A.) in a paper dealing with the viability of children deprived of women's milk during the first year of life, spoke of the need of some method of estimating the value of sufficient means of saving infant life at this period. Collaboration between scientific workers and social or philanthropic workers was necessary. He exhibited "score cards" which he had found useful as indicators of the value of philanthropic and other measures.

Discussion on the Ductless Glands

Saturday, August 9, Mr. Hastings Gilford (Reading) read a paper on "The Influence of the Ductless Glands on Development." He said that to one who attempted to assimilate the information on the ductless glands which had been collected by Sajous, Swale Vincent, Biedl or by Cushing, or who went to the sources of their supply, could not but be struck by the growing importance of the subject. At the same time it became evident that this information could not, as yet, be brought to a focus. Information as to the uses of the ductless glands must still be gathered mainly from clinical, surgical and post-mortem study. The subject was one of correlation, not so much of correlation itself as of the excitement or depression of correlation. In all probability it was the mere mechanical penetration of the germ cell by the sperm cell which was the stimulus for the first correlation in all vertebrates, the fusion of sperm with germ afterward supplying that blend of characters which constituted complete fertilization. Next there came a period of development in which as yet there were no ductless glands, when, as in plants, the necessary stimulus to correlation was both simple and direct. For a time there must exist in the primitive embryo some simple secretive mechanism which later on would be gradually segregated into organs and become ductless glands, devoted to the production of hormones to excite and harmonize the action of widely separated organs. It might be suggested that this primitive faculty of cells was never lost and that in after life the ductless glands did not monopolize the power of chemical stimuli to correlation, but that all tissues possessed some degree of the same property. It might be in some such way as this that local correlations could be explained. Thus, when a segment of a long bone was destroyed in infancy the growth of muscle, fat, vessels, nerves and skin did not continue as on the sound limb. On the contrary, a considerable degree of adjustment took place. Such correlation was not solely the outcome of disuse, for a similar process was at work in the limbs of the rickety and the achondroplastic. Local adjustments of this sort varied greatly in their completeness. It was true that achondroplasia was one of the disorders which had been attributed to deficiencies of pituitary secretion, but on the other hand, the locality and nature of the changes seemed to point to the skeleton as the prime seat of the disease. Another disorder which appeared to point to correlating influences apart from ductless glands was nucrocephaly. He said that the object which he had before him was to emphasize the doctrine just brought forward by Bernard, that although the ductless glands served an important purpose in the correlations of the body, they were only a part of the machinery of adjustment. For rapid adjustments, the nervous system came into play, and for slower adjustments one had to consider not only the ductless glands, but also that primitive capacity for adjustment which was inherent in the tissues of all parts of the body.

Speaking of the disorders of the ductless glands he said that out of the fog which at present obscured the subject a few clinical types of disease, the outcome of pathologic changes in the ductless glands, were gradually emerging. They were as yet very ill defined owing partly to overlapping of their symptoms, partly to the variability of the effects produced by similar lesions and possibly partly to the influence of such other factors as he had just referred to. Yet there was some hope that we were on the right track for the solution of the problem. It was right that we should coordinate our knowledge and formulate our theories, even though we were conscious that book knowledge and theories were fallacious.

He then considered abnormalities of the function of the thyroid gland, pointing out that though myxedema was regarded as hypothyroidism and Graves' disease as hyperthyroidism, the one was by no means an antithesis of the other. Speaking of the lymphatic system, he said that when lymphatic structures were overgrown the condition known as lymphatism was present. An infant in such a state, in its most characteristic form, was fat, pale and stolid, though the intake of food might be under the average. Lymphatic tissue apparently inhibited to some degree the action of the thyroid, the pars anterior of the pituitary gland and the sex organs. Destruction of the large tracts of the lymph system, as in Hodgkin's disease, gave rise to a syndrome in which emaciation and debility were conspicuous.

Speaking of the sexual system, he stated that all attempts to influence growth and development by extracts from the sex glands had failed. We were not in a position to conclude that the series of changes which took place at puberty were solely the result of the pouring out of secretion from the sex glands, nor were we justified in assuming that the changes at the menopause were solely due to its withdrawal. He afterward dealt with the pituitary system, stating that among the disorders attributed to defective action of the hypophysis were ateliosis and progeria.

He also considered the sexual group of diseases and those of the suprarenal system. He concluded by saying that for the answer to the question as to the causes of the defective or the excessive action of any ductless gland, one must go to genetics. This branch of biology showed that as there was a normal size and a normal action, so also was it as inevitable as light to darkness that size and function must occasionally become abnormal and fall into extremes. By studying these extremes, one arrived at some sort of conclusion, however hazy, as to the normal action of the ductless glands. In the harmony which is provided by the concerted action of the ductless glands there was reason to suppose that the leading part was played by the thyroid. This supplied a stimulus for the metabolism of the body as a whole. During infancy and childhood the influence of the thyroid was checked by the thymus gland, by the lymphatic system and perhaps by the pineal gland. These also brought about that delay of sexual activity which was so essential to the proper maturation and stability of the somatic faculties. Probably the first to break through this cordon of conservative influences were the adrenal glands, which awakened the dormant sexual organs and hastened the growth of the muscular and skeletal systems. At about the same time the skeletal system was still further stimulated by secretions from the pituitary gland. This secretion hastened the development of every organ in the body, including the sex organs. These latter now ripened apace, and assisted by the combined action of the ductless glands, sometimes animating, at others restraining, carried the development of the body in waves and tides to its flood.

Dr. d'Oelsnitz (Nice) contributed a paper on "Chronic Suprarenal Inadequacy in Infants." In the discussion which followed, Dr. Koplik (New York) said that he had been impressed by the associated disturbances of the viscera generally in abnormalities of the ductless glands. In the case of children the intestine was almost invariably disordered.

Prof. Swale Vincent thought that much more was being taught about internal secretion than was really known. The difficulties were enormous. Extirpation of the thyroid never produced myxedema. The pathology of myxedema or cretinism was something more than merely thyroid insufficiency.

Dr. Leonard Guthrie said that there was a distinction to be drawn between the obesity of Fröhlich's syndrome and that of hypernephroma. In the former the appearance was that of infantilism, in the latter that of fat adults.

A paper was also contributed by Dr. Fischer of New York on the treatment of septic cases of scarlet fever by neosalvarsan. He had treated ten apparently hopeless cases in this way, of which three recovered. He thought it was worthy of trial in cases in which nothing else could be done.

(To be continued)

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

Albany Medical Annals

August, XXXIV, No. 8, pp. 445-508

1 Present Status of Renal Functional Tests with Special Reference to Phenolsulphonephthalein. N. K. From and J. F. Southwell.
2 Acute Thyroiditis as a Complication of Acute Tonsillitis.
3 First Report of the Medical Inspector of Schools to the Board of Education. C. P. McCord.

American Journal of Diseases of Children, Chicago

August, VI, No. 2, pp. 65-144

4 *Pancreatic Insufficiency. L. Porter, San Francisco.
5 *Status Thymolymphaticus. W. L. Bierring, J. A. Goodrich C. F. Theisen
and D. Glomset, Des Moines, Iowa.
6 Needle in Heart Fifteen Months; Death; Autopsy. W. P. Northrup, New York.
7 Diagnosis of Intussusception by Roentgenoscopy; Report of Case. I. M. Snow and M. Clinton, Buffalo, N. Y.
8 *Mucous Cyst of Cecum in Infant Ten Weeks Old, Producing Obstruction of Ileocecal Valve and Symptoms Simulating Intussusception. A. D. Blackader, Montreal.
9 *Cardiac Disease in Childhood, with Special Reference to Prognosis. C. H. Dunn, Boston.
10 *Diagnosis and Treatment of Pyelitis in Infancy. R. G. Freeman, New York.
11 *Analysis of One Thousand Cases of Epidemic Measles. C. V. Craster, Rosebank, N. Y.

4. **Pancreatic Insufficiency.**—From a clinical and bacteriologic study of three cases, Porter concludes that in the group of cases characterized by waste of most of the ingested fat, with or without loss of the ingested starches and proteins, we are probably dealing with a bacterial invasion of the pancreas secondary to the presence of an abnormal bacterial flora in the small intestine. To Porter the question of the value of vaccines in such a condition is brought up because in one case the results following the use of a vaccine were so striking that it seemed impossible that mere coincidence will explain them. It is not suggested that one certain organism is specific for this condition, although Porter regards it as quite reasonable that any pathogenic bacterium, or even the colon bacillus, under abnormal intestinal conditions, may become the inciter of a pancreatitis which may lead to a suppression or deficiency in one or the other of the pancreatic ferments.

5. **Status Thymolymphaticus.**—The four cases studied by the authors presented the same symptom-complex: pasty complexion, a flabby fat overgrowth, hypertrophied tonsils and adenoids, enlarged cervical, axillary, and inguinal lymph-nodes and signs of an enlarged thymus; all were bottle-fed and had the "pot belly" of the rachitic. Three of the four had a preliminary deafness. Three of the four had seizures of choking or attacks suggesting thymic asthma. All were apparently well nourished. In all no malady sufficient to cause death was noted clinically. In all cases death occurred before the arrival of a physician and under very similar circumstances. No other similar cases are known among the playmates or friends. All were of nervous temperament and became easily excited. One child had diphtheria in 1911 and was given 5,000 units of antitoxin, the other three children receiving at the same time 1,000 units each for prophylactic purposes. The post-mortem findings were practically identical in the four cases: the lymphoid hyperplasia and enlarged thymus prevailed in each. The weight of the thymi were, respectively, 42, 54, 25 and 40 gm. The histologic changes found in all of the cases are extremely suggestive of a chronic inflammation affecting principally the lymphatic tissues. Whether this chronic inflammatory reaction has been produced by poisonous substances formed in some other part of the body or eliminated by some unknown micro-organism affecting the lymphatic tissues, is difficult to say. The authors find it difficult to conceive that the enlargement of the thymus was the main causative factor in the deaths of the children.

8. **Mucous Cyst of Cecum.**—A child, aged 10 weeks, was first seen for continued vomiting. The infant had been nursed by its mother and had thriven well for the first two months of life. Then it began to vomit after taking nourishment. The physician who first saw it regarded the mother's milk as the cause of the trouble and advised artificial feeding. This was tried without benefit; the vomiting persisted and the nutrition failed rapidly. There was no pyrexia. The consultant recognized a sausage-shaped tumor in the lower right quadrant of the abdomen, 3 inches long by about 1 inch in diameter, freely movable, not tender; no muscular rigidity of abdominal walls. Distinct peristaltic waves were noticed traveling toward the site of the tumor. Shortly after entrance into the ward a high enema was given which brought away no flatus, and only a small amount of feces, in which there was no appearance of blood or much mucus. Following this the abdomen was immediately opened under spinal anesthesia. The oblong tumor mass was found to involve the lower portion of the ileum and cecum; above the mass the ileum was much distended, while below it the ascending colon was collapsed. Regarding it at first as an ileocecal intussusception, careful efforts were made at reduction, and when they failed, a resection was performed with end to end anastomosis, and the abdomen closed. On examination afterward of the incised mass its true nature was disclosed. Death occurred from peritonitis.

The pathologic report on the specimens removed at operation was as follows: "The tumor consists of the lower portion of the cecum with its contained cyst, and the appendix. The cyst, much collapsed, measures about 2 cm. in diameter, is unilocular, contains glairy mucoid material and is situated on the wall of the cecum opposite the ileocecal valve, extending over to and completely obstructing that orifice." Microscopic examination of the cyst walls showed the surface of the tumor projecting into the lumen of the cecum to be covered with mucous membrane similar to that of the intestine; the cyst to be lined with a somewhat stretched layer of columnar epithelium which, however, in some places was folded into gland formations. Beneath each surface of epithelium was a submucosa infiltrated with lymphocytes, and between these again are three more or less distinct layers of muscle. From this report the cyst was regarded as in all probability a retention cyst, arising either from some fault in development or from an inflammatory occlusion of the mouth of the original gland.

9. **Cardiac Disease in Childhood.**—The series of cases included in Dunn's investigation numbers 304 cases of cardiac disease. It throws a certain amount of light on the relative frequency of occurrence of the various etiologic factors. Rheumatic fever, 264 cases, 87 per cent.; congenital lesions, 21 cases, 7 per cent.; some recognized infection other than rheumatic fever, 9 cases, 3 per cent.; unknown etiology, 10 cases, 3 per cent. Acute infection, 206 cases, 78 per cent.; chronic endocarditis, 58 cases, 22 per cent.

Dunn points out that rheumatic fever is very much the commonest cause of cardiac disease in childhood. Cases with acute rheumatic infection localized in the heart are much commoner than patients suffering from chronic endocarditis.

Cardiac symptoms are due to two causes: first, acute infection localized in the heart; second, broken cardiac compensation. Of these two causes the first is the commoner. The liability of children to recurrent attacks of acute rheumatic infection, in any of which the heart may be involved, is very great. The immediate mortality of rheumatic cardiac disease is about 20 per cent. The subsequent mortality of patients with endocarditis of rheumatic origin, followed for at least ten years, is about 50 per cent. The final mortality of rheumatic fever followed for at least ten years is 60 per cent. The mortality is seen chiefly during childhood. The mortality after young adult life is reached falls to only 7 per cent.

The cause of death is heart failure. The cause of the heart failure may be either acute cardiac infection or broken compensation. In childhood the former cause is far the more common. After adult life is reached the latter cause is more common. The particular valvular lesion present has little or no relation either to the mortality or the amount of disability in adult life; except that aortic disease appears to be a particularly fatal lesion in childhood. The causes of the great mortality of rheumatic fever in children are: first, their greater liability to this infection; second, their greater liability to recurrent attacks; third, their greater liability to cardiac involvement. Patients who escape the dangers of childhood, and who enter adult life, are apt to show a remarkable freedom from disability. The majority of such patients can lead normal active lives. The probable cause of this freedom from disability lies in the fact that the cardiac damage occurs during the period of growth, and during this period a particularly perfect adaptation can take place between the heart and the patient, which enables the heart to meet the demands made on it. This adaptation is more perfect than can be attained in the adult. The earlier in life the cardiac lesion is acquired, the better is apt to be the result in adult life, as concerns ability to lead an active, normal existence; provided that the patient escapes the dangers of childhood. Treatment should be directed toward favoring the adaptation of child and heart. While guarding against overstrain, we must avoid too great limiting of the normal activities of childhood. In congenital cardiac disease, open ductus arteriosus is a favorable lesion.

10. **Diagnosis and Treatment of Pyelitis in Infancy.**—Pyelitis in infancy, due to the invasion of the pelvis of the kidney with colon bacteria resulting in a purulent inflammation, Freeman believes, can apparently occur with no perceptible rise of temperature at any time. These cases should be treated and cured by the means ordinarily used in pyelitis. The alkaline treatment of pyelitis, while it is safe and will control many cases, is markedly less efficient than other methods of treatment. Vaccines, either autogenous or commercial, are useful in controlling the constitutional symptoms of pyelitis. Hexamethylenamin, while sometimes effective in doses of from ½ to 2 grains several times a day, will not in these doses cure certain cases which may be controlled by very large doses.

Freeman urges that hexamethylenamin should always be administered in small doses first, but the dose should be rapidly run up, the child and its urine being carefully watched for symptoms of irritation of the kidneys.

Large doses of hexamethylenamin should not usually be continued for more than a week at a time, and then after several days without any treatment or with alkaline treatment it should be started at the maximum dose given before and the amount increased daily until an influence on the urine is obtained. Doses of 25 grains daily in a child of 6 months, and from 35 to 45 grains a day in a child from 9 to 12 months may be safely given in this way to some infants.

11. **Epidemic Measles.**—Of the 1,000 cases of measles studied by Craster the greatest number were in the month of June (186). The third year age period shows the greatest incidence of attack (195). The largest complication percentage, 81.3, and case mortality, 34.3 per cent., are found in the first year period. The seasonal prevalence of complication was highest in December, 78.6 per cent., and of case mortality in January, 25.2 per cent. The most frequent complication was otitis media, 495. The most common cause of death, bronchopneumonia and enteritis, 23.3 per cent. of total deaths. Average duration of the fever, four days. The onset of purulent otitis media on tenth or twelfth day may not be attended by unusual fever. If the temperature remains high after the fourth day, a possible grave complication is imminent. An initial high temperature does not necessarily point to a possible severe attack.

American Journal of Medical Sciences, Philadelphia

August, CXLVI, No. 2, pp. 157-312

12 Experiences in Twelve Cases with Steinmann's Nail-Extension Method in Fractures of Femur. *J. C. A. Gerster, New York.*

13 *Relations of Internal Secretion to Mental Conditions. L. V. F. Hochwart, Vienna.*

14 *Experimental Study of Sodium Bicarbonate and Other Allied Salts in Shock. M. G. Seelig, J. Tierney and F. Rodenbaugh, St. Louis.

15 *Pinching Appendix in Diagnosis of Chronic Appendicitis. A. Bassler, New York.
16 *Effects of Continuous Administration of Hypophysis Extract. J. H. Musser, Philadelphia.
17 *Tuberculin Therapy in Surgical Tuberculosis, with Correct Dosage Accurately Determined by Cutaneous Reaction. B. Z. Cashman, Lafayette, Ind.
18 *Influence on Gastric Secretion of Aseptic Foreign Bodies in Gall-Bladder. O. H. P. Pepper, Philadelphia.
19 Congenital Bilateral Fistulas of Lower Lip. L. M. Kahn, New York.
20 *Etiology of Pernicious Anemia. J. T. Pilcher, Brooklyn.
21 Rôle of Hydrotherapy in Treatment of Pellagra. G. M. Niles, Atlanta, Ga.
22 Analogies of Pellagra and the Mosquito. S. R. Roberts, Atlanta, Ga.
23 *Intensive Study of Epidemiology of Pellagra. J. F. Siler and O. E. Garrison, New York.

14. **Sodium Bicarbonate.**—Every infusion of sodium bicarbonate made by the authors caused a pronounced rise of blood-pressure following immediately on the start of the injection and being well sustained for varying periods. Hand in hand with the rise of pressure went an increase of amplitude of heart beat. This increase varied quantitatively as did the rise of pressure itself, its chief characteristic being its constancy. Not infrequently the amplitude of beat was doubled immediately after the injection of the bicarbonate, and the increased amplitude often persisted for half an hour or longer after the injection of the solution. In all of their fifty experiments with sodium bicarbonate they could not determine any effect on the rate of heart beat. When the bicarbonate was administered before shock was induced the rate of beat was not quickened, and when it was administered during the period of rapid heart action incidental to shock the rate was not slowed. In addition to its influence on the cardiovascular apparatus the sodium bicarbonate infusions exerted a marked effect on the respiratory function. The rate of respiration was sometimes increased, sometimes slowed, and sometimes unaffected.

These variations did not seem to depend on idiosyncrasies in the different dogs, for they observed all in the same dog following different injections of the same amount of the drug. The notable fact was that the depth of respiration was increased. The rise of pressure following the injections was not due to mere bulk of fluid. In a number of experiments a distinct rise was noted after the introduction of from 2 to 5 c.c. of a normal solution of sodium bicarbonate. In shock there is said to be an escape of plasma from the blood-vessels into the tissues. It has even been suggested that shock is due to increased specific gravity of the blood. It is possible that the introduction of a hypertonic solution might accomplish this purpose and that the sodium bicarbonate infusions might have been effective on this basis.

That this assumption is not correct, however, the authors proved by the simple experiment of infusing shocked dogs with the hypertonic salt solution and with hypertonic basic sodium phosphate solutions, with practically no effect on the low blood-pressure. Neither could alkalinity alone explain the rise in pressure. Sodium carbonate, for example, which is a much more strongly alkaline salt than is sodium bicarbonate, invariably gave a pronouncedly less marked rise of pressure. The basic sodic phosphate in most of the experiments gave no rise of pressure (this basic salt is in reality only slightly alkaline), and when a rise did occur following its use the authors were unable to determine positively that this rise was not coincidental rather than a casual result. The various solutions of sodic hydrate never caused a rise. The tribasic sodic phosphate, which is a strongly alkaline salt, caused only slight rise, and this rise was immediately followed by a fall that in two instances ushered in death.

The authors conclude that the pressor effect of sodium bicarbonate does not depend solely on the alkalinity of this salt. This conclusion is important in its bearing on the possible relationship between shock and acidosis. The possible blood-pressure raising effect of carbon-dioxid gas supplied directly to the blood in shock was also tested out. By properly regulating the flow of gas they could administer it over an indefinite period of time, and although the administration stimulated the respiratory function most actively it did not influence the rate of heart beat, amplitude of pulse pressure, or height of blood-pressure. When the carbon-dioxid gas was administered before shock was instituted it had no influence in warding off the oncoming fall of pressure, and when administered during shock it likewise had no influence in restoring pressure toward a normal level. It would seem to be clearly established therefore both that the pressor effect of sodium bicarbonate does not reside in the carbon dioxid radical, and that shock itself cannot be referred to acapnia. The direct vasomotor effect of the sodium bicarbonate solution on the blood-vessels was not tested out.

15. **Diagnosis of Chronic Appendicitis.**—Bassler describes the method of pinching the appendix as follows: If the patient is not too stout the lower border of the cecum is percussed from Poupart's ligament upward. Fortunately the cecum is usually distended with gas and an accurate level of the cecum when the patient is on the back can be determined. After this is noted, percussion transversely across the cecum is made to obtain its outer and inner edge. The outer edge is always possible of being noted. In percussing for this it is necessary when on the outer edge that the percussion stroke be directed straight backward toward the lateral edge of the body, and when on the inner, directly backward toward the junction of the psoas and iliacus muscles, at that area these lines being more oblique than the outer edge of the rectus. With an estimation of about where the appendix would be as judged from the location of the lower end and sides of the cecum, pressure on the abdomen should be made at that point.

When the cecum cannot be mapped out by percussion or the subject is well developed, and even in all, the second plan is to note the position of the right edge of the rectus muscle on the umbilical-spine line maintaining the site with a finger. Having the patient rise to a sitting position helps in palpating for the rectus edge. Standing at the right and facing the patient (for right-handed individuals) the thumb is placed vertical on the abdomen, the tip of the thumb pointing to the ensiform, when it is slowly pressed backward into the abdomen, not inward, outward, up or down. When the thumb has been sunk about half-way down to the back of the abdominal cavity, it is swung to the right of the patient at a right angle to the downward pressure line. This pinches the appendix against the iliacus muscle and unyielding structures under and at the side of it, and usually elicits pain or tenderness. It is well, having done this in the mid-distance between the anterior superior spine and the umbilicus and not having obtained tenderness, to move the thumb down about ½ inch, performing it again, and so on downward until one has reached almost to the brim of the pelvis. The same procedure on the left side serves as a control. By means of this method of downward and then right lateral pressure it is possible to elicit tenderness in the average case of chronic appendicitis. When tenderness is obtained on transverse pressure to the left it may be a Lane's kink, and when below it may be a tender ovary instead of an appendix.

16. **Effects of Extract of Hypophysis.**—Eighteen individuals were given the dried extract of the whole pituitary gland without other medication by Musser. The following effects were noted: Blood-pressure: Seventeen showed a rise in systolic blood-pressure, the greatest rise being 28 mm. of mercury. Usually a corresponding rise in diastolic pressure occurred, though rarely it remained at the same height as before taking the extract or even became lower. Pulse rate: The changes in the pulse rate were inconstant; an increase was generally observed, though in two individuals the rate was decidedly decreased. Diuresis: Six individuals noted a diuretic effect. The extent, absence, or presence of this symptom could not be accurately determined. The urine showed no particular change except in one case. Glycosuria was never observed. Intestinal tract: Diarrhea developed in seven cases, and four, previously costive, had daily movements during the period of taking the drug.

Subjective symptoms: Four individuals were apparently much benefited by the rise in pressure and general stimulative effect of the glandular extract on the unstriated muscle, and one person was benefited through the diuretic effect of the extract. In the remaining patients there was little effect noted except by those who developed the rather annoying diarrhea. Musser concludes therefore that prolonged administration of extracts of the pituitary gland exert a distinct pressor effect on the peripheral vascular apparatus, which persists for an appreciable time after discontinuation of the drug. This is apparently the only consistent effect following continued administration of the gland *per oram*; other results are variable and indefinite.

17. For description of this method which was introduced by White and Van Normal, see abstract, The Journal, Nov. 5, 1910, p. 1682.

18. **Influence of Foreign Bodies in Gall-Bladder.**—Experiments were undertaken by Pepper in the hope of finding some explanation for the gastric hyperacidity so frequently found clinically in association with cholelithiasis. Lichty's work on the same subject and covering the same ground appeared before the work was completed, thus rendering unnecessary their further prosecution. It seems worth while to Pepper, however, to report the results obtained in the first simple phase of the investigation, partly because they are not in general in accord with those of Lichty and partly because they control possible sources of error in his work. These are the use of the stomach-tube in feeding the animals, the administration of food at irregular intervals, and the brief postoperative period of observation. The essential feature of the experiment was to place in the gall-bladder with as little trauma as possible a more or less smooth sterile object, too large to enter the ducts, and after appropriate intervals to study the gastric secretion. The gastric analyses showed no changes as the result of the experimental procedure. In two animals the average acidity after operation was higher than before, while in the other two the reverse was true. In all the animals, both before and after operation, the averages for free hydrochloric acid lay between the figures 16 and 24.6.

20. **Etiology of Pernicious Anemia.**—Pilcher maintains that achlorhydria is merely a symptom denoting a marked degree of chronic gastritis. It is usually evoked through extra-gastric irritative factors which are in many instances capable of correction. There are, without exception, present in such stomachs great numbers of bacteria ordinarily considered pathogenic, among which streptococci are especially to be noted. Practically all recorded cases of authenticated pernicious anemia present the symptom of achlorhydria, and in his own series of thirty-four cases the presence of occult blood in the stomach extract. Thirty-four instances of pernicious anemia were noted in patients presenting the symptom of achlorhydria hemorrhagica gastrica. In a few of these cases the lack of hydrochloric acid and the presence of occult blood were known to be present at least one year before any blood-changes were to be noted. In others the phenomena of paresthesia were evidenced some time previous to blood impairment, and many had suffered for years from chronic gastrointestinal complaints. Eighty per cent. of cases of pernicious anemia have increased temperature some time during the course of the disease.

Pure cultures of streptococci have been found by competent observers in the blood of patients with pernicious anemia who were running a fever. Bacterial hemolysins are known to produce anemia resembling the pernicious type, as are other toxic substances, among which may be classed the lipoid group. Efforts directed to the control of bacterial growth in the body and particularly in the gastro-intestinal tract have caused complete remissions in this disease in some instances. The phenomena of occurrence, remission and reoccurrence of the blood-picture characteristic of pernicious anemia may be explained by our present knowledge of the action of toxins from whatever source, impairing the formation of antibodies until a bacteremia is produced which may be clinically recognized. The toxins present being eliminated by the profuse flora in the gastro-intestinal tract, the impairment of bodily resistance is accomplished through their absorption and the disturbance of digestion in cases of achlorhydria.

Finally, reactive and combative ability of patients suffering with achlorhydria varies in different patients, and on this ground alone might be explained the relatively rare occurrence of pernicious anemia, although the occurrence of achlorhydia is fairly common. Thus the development of pernicious anemia wound seem to be dependent on a personal idiosyncrasy of certain individuals; in fact, we must revert for the real etiologic factor of its inception to an embryonic tendency, the presence of which we are not as yet able to determine, until it has been stimulated into an active destructive agent of the blood by the toxins absorbed from the profuse bacterial flora present in the stomach.

23. **Epidemiology of Pellagra.**—The epidemiologic data presented in this report by Siler and Garrison are summarized as follows: 1. Pellagra shows a striking inequality of distribution in the ten townships within the county, the township rate of prevalence per 10,000 of population varying from 0 to 71. The city of Spartanburg, with a population of 17,517 gave a rate of 49 per 10,000 against 34 per 10,000 for the remainder of the county. Density of population while showing a tendency to conform to the relative prevalence of the disease does not alone offer an explanation of the geographic inequalities of its distribution within the county. The cotton-mill-village population gives a rate of prevalence of 104 per 10,000 against 19 per 10,000 for the remainder of the county, and against 16 per 10,000 for the rural sections alone. The variations in the rates of prevalence in the ten townships are in a measure proportional to the presence or absence of a large mill-village population. Excluding the mill-village population, there is still a marked discrepancy between the townships in the rural population alone, ranging from 0 to 29 cases per 10,000 of population. The excessive prevalence among the farming classes is found in the townships which have a relatively large mill-village population. The white population of the county gives a prevalence of 45 cases per 10,000; the negro population a prevalence of 9.5 per 10,000. Excluding the mill-village population which is practically all white, the remaining white population still gives a rate of prevalence (25.2 per 10,000) over two and a half times that among the negroes. The rate of prevalence per 10,000 for males in the county is 17; for females, 50.5 White males give a rate of 22.95 per 10,000; white females, 87.5 per 10,000; negro males, 3.9 per 10,000; negro females, 14.9 per 10,000. The rate of prevalence among children under 10 years of age and among adults aged 45 years and older is practically equal in the two sexes. The rate of prevalence drops among males between the ages of 19 and 45, whereas for females there is a remarkable excess of prevalence between these ages. In both males and females there is a striking fall in prevalence between the ages of 10 and 20 years.

The most significant fact with regard to occupation is the excessive prevalence of pellagra among women employed in housework. The excessive prevalence of pellagra in the mill-village population is found largely among women and children at home during the day. Among actual mill-workers the rate of prevalence between the two sexes appears to be about equal. One-half of the cases occurred singly in one family; about one-fourth occurred two in one family; the remaining fourth occurred in groups of three, four or five in one family.

The question of the possible relative importance of family relationship and household association is still under investigation. Among cases occurring singly in families, the proportion of children of both sexes under 10 years of age is low and that of adult females excessively high. Among cases occurring two or more in one family the proportion of young children is proportionately high, especially among males. While apparently authentic sporadic cases of pellagra within the county can be traced back to as early as 1894, the disease does not appear to have occurred in any great number of cases in any year until 1908. Since 1908 the incidence-rate appears to have rapidly increased each year to 1911. The number of new cases developing in 1911 appears to have been slightly greater than in 1912. There was no evidence pointing to any spring and fall recrudescence of the disease in the population so frequently referred to in the literature of pellagra. There is no particularly marked tendency for the seasonal recurrence to appear in an individual during the same month, year after year. Climatic conditions appear to influence the development of symptoms of the disease. If during the spring months precipitation is high, temperature low, and number of rainy days excessive, the appearance of acute symptoms, more particularly those involving the skin, is delayed.

It would appear that three or four years ago a large proportion of the cases observed in the county presented intestinal and nervous symptoms which were quite mild, and sometimes were confined almost exclusively to the cutaneous system, the disease appearing to be of a less virulent type in 1912 than in previous years. In the majority of cases (83 per cent.) economic conditions are poor and the disease is most prevalent among people of insufficient means. General health conditions in childhood do not appear to warrant consideration as etiologic factors when the disease develops in adult life. In a number of cases the development of pellagrous symptoms in children was preceded by one of the acute exanthematous diseases of childhood. About one-fourth of the cases gave a history of a preceding chronic disease in adult life.

In more than one-half of the cases (62 per cent.) most affected were married women (86 per cent.), and 86 per cent. of the married women had borne children. A history of illness immediately preceding the development of pellagra was elicited in 59 per cent. of the cases.

The most insanitary condition found in the county is the absence of properly constructed privies. Outside of a part of the city of Spartanburg which is supplied by a water-carriage sewage system, there is no effective provision in the county for the proper disposal of human excreta. A second striking unsanitary condition is the almost complete absence of effective screening of dwellings. These two conditions present a situation highly favorable to the transmission of disease organisms eliminated in the excreta, both by direct contamination of food and person and by insects. This situation is naturally aggravated in the mill-villages and small towns by the greater congestion of houses. The absence of effective screening for dwellings gives rise to conditions conducive to the possible transfer of diseases transmitted by biting insects.

Observations on the habitual use of the more common foodstuffs failed to discover any points of difference between pellagrins and non-pellagrins in the county or any facts which would seem to explain the strikingly greater prevalence of pellagra among certain classes of the population. The most striking defect in the general dietary of the working classes, appears to be the limited use of fresh meats, the animal protein being supplied largely in the form of cured meats, of which salt pork (especially bacon) is the most important. Unhygienic preparation of food appears to be a probable important factor in the general health of the population. Investigation of the kind, quantity, and quality of corn and corn products used in the county failed to bring to light any epidemiologic evidence pointing to the agency of corn as an etiologic factor in the disease. The presence of two cases in their series giving a definite history of no corn consumption within two years prior to the onset of symptoms, together with several other cases in which corn products were eaten, if at all, only in small quantity and at extremely rare intervals, would seem to argue strongly against any hypothesis that corn products alone are the causative agent of the disease.

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24 Retinal Detachment. R. Kuemmel, Erlangen, Germany.
25 Melanotic Sarcoma of the Chorioid, with Apparent Secondary Involvement of the Retina. G. F. Keiper, Lafayette, Ind.
26 Value of Prisms in Ophthalmic Practice. W. Reber, Philadelphia.
27 Color Adaptation. F. W. Edridge-Green, London.
28 Use of Conjunctival Flap in the Treatment of Corneal Infections and of Pannus. E. G. Starr, Buffalo.
29 Case of Macular Mole. A. C. Sautter, Philadelphia.

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30 Surgeon and Ptosis Problem: a Review. F. B. Lund, Boston.
31 *Rôle of Gastric and Intestinal Stasis in Some Cases of Epilepsy. H. Powers, Brooklyn, Mass.

31. Gastric and Intestinal Stasis in Epilepsy.—In the study of many cases of epilepsy in young children at the Children's Hospital, Powers came to believe that the gastro-intestinal disturbance preceded the epilepsy and was not merely a symptom. It must be admitted, he says, that the vast majority of individuals who suffer from stasis do not have epilepsy, but in his experience they do have headache, vertigo and other nervous symptoms caused by the toxemia that results from stasis. These symptoms of toxemia are of all shades of severity so that sometimes the diagnosis between these conditions and epilepsy is made with great difficulty and, it may be said, arbitrarily. Powers feels that in so-called "idiopathic" epilepsy the essential lesion is not in the nervous system. If it be true that epilepsy does not imply a defective central nervous system with a tendency to degeneration in the cells of the cortex and consequent mental deterioration, then the social status of the epileptic will have to be reconsidered. Laws designed to prevent the propagation of epileptics should then be so phrased as not to bar from marriage those in whom the disease is curable and probably not transmissible as such. A law barring from marriage the syphilitic, the alcoholic, the feebleminded and the insane would in effect bar those epileptics who ought not to be permitted to marry.

Finally, if it can be definitely established that the phenomenon known as "idiopathic," "inorganic" or "true" epilepsy is produced by a toxemia and that this toxemia is the result of stasis in the gastro-intestinal tract, the prognosis should be much better than it is at present, provided that the physician be equipped, not with drug therapy alone, but also with a knowledge of mechanical therapeutics, and that he use the bromids only as an adjunct to other treatment. A new exercise and a new method of self-massage for the treatment of stasis will be described in a subsequent paper.

Colorado Medicine, Denver

August, X, No. 8, pp. 229-254

32 Influence of Mental Attitude in the Treatment of Diseases of the Organs of Respiration and Circulation. E. J. A. Rogers, Denver.
33 Unstable Lung Capillary in Asthma. W. V. Gage, Primero, Colo.
34 Neurologic Notes. G. A. Moleen, Denver.
35 Skin Blemishes as Sites of Origin of Malignant Growths. A. J. Markley, Denver.
36 Simple and Accurate Method of Standardizing Vaccines. W. Burdick, Denver.
37 Infantile Cerebral Palsy. L. W. Ely, Denver.

Delaware State Medical Journal, Wilmington

July, IV, No. 8, pp. 1-26

38 Progress in Orthopedic Surgery. J. K. Young, Philadelphia.

Iowa State Medical Society Journal, Clinton

August, III, No. 2, pp. 73-145

39 When the Blind See. M. K. Heard, Iowa City.
40 Experience with Salvarsan. C. Van Epps, Iowa City.
41 Medicolegal Aspects of Fractures. J. W. Osborn, Des Moines.
42 Treatment of Puerperal Infections. G. A. Field, Des Moines.
43 Brain Syphilis. E R. Posner, Des Moines.
44 Acute Osteomyelitis. C. S. James, Centerville.
45 Hodgkin's Disease. E. E. Wuttke, Sumner.
46 Diseases of the Nervous System in Children. R. W. Sleeter, Rockford.
47 Practical Points on Blood-Pressure. T. Dulin, Sigourney, Iowa.

Journal-Lancet, Minneapolis

August 15, XXXIII, No. 16, pp. 445-473

48 Early Diagnosis of Cancer. M. MacGregor.
49 Carcinoma of the Uterus. J. Farrage, Deering, N. Dak.
50 Recent Research on the Treatment of Cancer. A. O. Aaker, Velva, N. Dak.
51 Causes and Prevention of Acquired Deafness. J D. Lew Minneapolis.
52 Transposition of Viscera. G. A. Landmann, Scotland, S. Dak.
53 Removal of a Stick-Pin from the Second Bifurcation of the Right Bronchus by Direct Bronchoscopy Under Local Anesthesia. J. S. Macnie, Minneapolis.

Medical Record, New York

August 23, LXXXIV, No. 8, pp. 323-368

54 *Inheritance of Epilepsy. D. Hecht, Chicago.
55 Feeble-Mindedness and Schoolchildren. E. B. McCready, Pittsburgh.
56 Uterine Syndrome. G. K. Dickinson, Jersey City, N. J.
57 Landry's Paralysis with Report of Case. H. W. Jones, Utica, N. Y.
58 Prolonged-Precipitate Parturition Due to Disengagement of Disproportionate Head. A. E. Gallant, New York.
59 *Appendix Free in Abdominal Cavity without Suppurative Peritonitis. J. Wagner, New York.
60 Traumatic Bilateral External Rectus Paralysis, with Transient Paresis of Left Facial Nerve. E. A. Shumway, Philadelphia.
61 *Sphygmomanometer of New Principle. G. Van N. Dearborn, Cambridge, Mass.

54. **Inheritance of Epilepsy.**—In summarizing the facts which to him seem worthy of emphasis in a discussion of the inheritance of epilepsy Hecht urges that human society must concern itself more and more with the qualities in man that are physical and vital, as opposed to those that are mental and moral. In heredity we find the most potential factor in the evolutionary process of man. Environmental influences may modify but do not increase our original endowment. The essential thing in the preservation of the race is physical fitness, and inheritance, in its turn, is the essential and most to be desired thing in the development of such fitness. The methods with which we are to-day better able to explain the qualities and attributes inherited by man are perhaps those referred to as mendelian and biometric. It should, however, be thoroughly understood that no biologic phenomena, either in full or even in large part, meet the theoretic expectations of either method. The inheritance of epilepsy, however, is very worthy of being subjected to an analysis. Mendelian or biometric, in the hope that valuable data may be secured and in the end enable us to invoke the proper measures against the spread of the disease. The studies already made Hecht regards as highly instructive and suggestive, although there are many sources of error which to them seem almost impossible to overcome. Society has the moral right to interfere with the continuance of any human stock definitely known to be unalterably unsound and on the assumption that an overwhelming proportion of epileptics are of this type, the plan of segregation, efficiently and scientifically carried out, is a just one. The act of sterilization in the light of present knowledge is still open to criticism and objection and may, therefore, be considered premature and as a measure of legislative interference should not be endorsed. The mildly inferior epileptic constitutes a very great menace and one concerning which scientists are not prepared to make recommendation.

59. **Appendix Free in Abdominal Cavity without Suppurative Peritonitis.**—The appendix in Wagner's case was free of its cecal attachment, without any evidence of a purulent peritonitis, the exudative condition present being due to a carcinosis. The separation is explained by the pathologic condition in the appendix. The lumen was entirely occluded, probably involving the blood-vessels at the base to such an extent that sloughing was the natural sequence, the occluded lumen preventing infection of the peritoneal cavity. Omentum, bladder, rectum, intestines, and parietal peritoneum, all showed evidence of involvement.

61. **Sphygmomanometer of New Principle.**—Dearborn's sphygmomanometer consists merely of a properly adapted distal end-piece of an ordinary stethoscope firmly attached by a screw-thread to a spring-dynamometer with a transparent handle by means of which it may be grasped readily and pressed against the artery by the observer.

New York Medical Journal

August 23, XCVIII, No. 8, pp. 353-400

62 Topography of Bladder, with Special Reference to Cystoscopy. V. C. Pedersen, New York.
63 Modern Diagnosis and Treatment of Gynecologic and Obstetric Patients with Syphilis. J. B. Squier, New York.
64 Surgical Indications of Certain Gastro-Intestinal Symptoms. J. Douglas, New York.
65 *Importance of Serologic Analyses in Neurology. D. M. Kaplan, New York.
66 *Respirator: Appliance for Resuscitation by Producing Enforced Artificial Respiration; Report of One Hundred and Sixty-Three Experiments. H. E. Tompkins, New York.
67 Cesarean Section with Hysterectomy in Cases of Positive Infection. J. F. Baldwin, Columbus, Ohio.
68 Appendix and Some of Its Diseases. H. H. Hielscher, Mankato, Minn.
69 Carbon, Oxygen, Hydrogen Group, Plus Nitrogen or Non-Nitrogenized and Nitrogenized Food. J. C. Densten, Scranton, Pa.
70 Case of Septicopyemia. W. B. Coffey, G. R. Carson and W. T. Cummins, San Francisco.
71 Some Reasons for Advising No Delay in Operating All Forms of Hernia. J. Frankel, New York.

65. **Serologic Analyses in Neurology.**—As the result of his research Kaplan found that the Wassermann reaction is not present in the spinal fluid in all cases of syphilitic and parasyphilitic disease of the central nervous system. The use of increasing amounts of spinal fluid for the Wassermann test (*Auswertungs Methode* of Hauptmann) is a procedure capable of giving rise to non-specific inhibition in patients who did not come in contact with this disease. Serologically all nervous diseases are divided into two general and easily distinguishable classes, the negative and positive types. The negative type represents the non-luetic nervous diseases, the positive type the syphilitic and the parasyphilitic diseases. In the positive type group further differentiation is possible by serologic investigation in cases in which physical differentiation is difficult, such as between general paresis and cerebrospinal lues. Active and proper treatment markedly alters serologic pictures in many of the positive types. Such alteration may go on to any extent, even to the reduction to a complete negative picture. The greatest change to the negative occurs in cerebrospinal lues and the least in general paresis. In the cell-count in tabes may be found an index for or against treatment. Fully developed general paresis is best left untreated. Spinal cord compression from tumors or other causes shows a protein excess and an absence of pleocytosis.

66. **Respirator.**—The respirator devised by Tompkins is not cumbersome and heavy; in fact, it can be carried in a small case and weighs less than ten pounds. It does not depend on any brand of oxygen, nor does its operation depend on compressed gas. It is operated by hand and foot in the least tiring manner; both hand and foot can be changed without losing time or causing trouble. Its apparent initial cost is low, and it has no cost of upkeep. Finally, it makes use of air. If it is desired oxygen may be employed, or a combination of oxygen with a definite proportion of carbon dioxid, but Tompkins uses atmospheric air of which there is always a plentiful supply.

The technic is as follows: With the patient lying down, the shoulders are raised by means of a pad, so that the head falls well back. The mouth is opened and a prop or gag placed between the jaws. False teeth or other loose articles are removed from the mouth. Grasp the tongue and draw it, even strain it, well forward, pulling it as far as it will go. Pass the finger down the throat and swab out any mucus that may be present, and draw the epiglottis against the base of the tongue. The tongue, being held as well forward as possible, the mask is adapted to the face. With the tongue between the mask and the chin, and held firmly in place by a piece of gauze, strap the mask to the face; it must be very tight, so that no air may leak in or out. These details having been observed, the mask is connected to the valve mechanism by a piece of rubber tubing from eight to twelve inches long. The valve mechanism is connected by more tubing to a pump or bellows of some description. All connections being well made and tight, the bellows is pumped and air forced along the tubing through the valves into the lungs. By pressing down on the valve stem, the air in the lungs is forced out into the atmosphere by the elasticity of the lung tissue. The valve stem is allowed to rise, and air is again admitted to the lungs. The raising and lowering of the valve stem controls the number of respirations allowed per minute. On the valve mechanism is found a safety valve which controls the pressure of air. When the pressure of air in the lungs reaches a predetermined point, as set for on the index, this valve allows the excess air to pass into the atmosphere, and thus keep the pressure down to where it can do no harm. This is all there is to the machine.

Mississippi Medical Monthly, Vicksburg

August, XVIII, No. 4, pp. 65-86

72 Immunity. W. A. Dearman, Long Beach.
73 Care of Mouth During Sickness. J. H. Brown, Newton.
74 Some Pathologic Conditions Following Typhoid, with Report of Case. E. S. Bramlett, Osford.

New Orleans Medical and Surgical Journal

August, LXVI, No. 2, pp. 93-172

75 Clinical Studies in Pituitary Irritation with Report of Case. L. J. Genella, New Orleans.
76 Ocular Complications of Measles. C. A. Bahn, New Orleans.
77 Fly and Its Extermination. G. C. Chandler, Shreveport, La.
78 New Health Commandant. O. Dowling, Shreveport, La.
79 Case of Pellagra Treated with Salvarsan. D. W. Kelly, Winfield, La.
80 *Legislation—State and Local: What It May Accomplish for Sanitation. S. D. Porter, New Orleans.
81 Malaria in Louisiana. J. H. White, New Orleans.
82 Anomalies of Sacrolumbar Articulation. E. S. Hatch, New Orleans.
83 Neutrophil Leukocytic Picture as Guide for Tuberculins. W. J. Durel, New Orleans.
84 *Ehrmann's Palmin Tests. J. A. Storck, New Orleans.
85 Vicissitudes of Scrofula. A. J. Delcourt, Houma, La.

80 and 84. Abstracted in The Journal, May 10, p. 1487.

Public Health Journal, Toronto

August, IV, No. 8, pp. 443-488

86 Does Vaccination Protect? J. Roberts, Hamilton, Ontario.
87 The Scope of Sanitary Work in the Home. C. A. Hodgetts, Ottawa.
88 How Can Cross-Infection Be Prevented in a Hospital for Communicable Diseases? M. B. Whyte, Toronto.
89 Sanitary Work among the Foreign Population. C. N. Laurie, Port Arthur, Ontario.
90 Suppression Preferable to Segregation. J. L. Beavers, Atlanta, Ga.
91 What New Zealand Does to Promote the Health of the Women and Children. Mrs. Massey.

Vermont Medical Monthly, Burlington

July, XIX, No. 7, pp 157-182

92 Diagnosis and Treatment of Syphilis. J. Daland, Philadelphia.
93 Ehrlich Remedy in Treatment of Syphilis. J. Daland, Philadelphia.
94 Value and Meaning of the Wassermann Reaction. E. H. Buttles, Burlington, Vt.

West Virginia Medical Journal, Wheeling

August, VIII, No. 2, pp. 37-70

95 Carcinoma of the Stomach from a Surgical Standpoint. R. E Venning, Charlestown.
96 Urologic Diagnosis. E. O. Smith, Cincinnati.
97 Importance of the Early Recognition of Surgical Lesions on the Liver and Bile Ducts. C. R. Ogden, Clarksburg.
98 Etiology of Milium. G. A. Aschman, Wheeling.
99 Local Anesthesia in the Radical Cure of Inguinal Hernia. T. K. Oates, Martinsburg.
100 Treatment of Arteriosclerosis. L. F. Bishop, New York.

FOREIGN

Titles marked with an *asterisk* (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

August 2, No. 2744, pp. 213-284

1 Influence of the British Medical Association in the Establishment of Ophthalmology as a Special Science. T. H. Bickerton.
2 *General Toxic Effect of Paints. B. Moore, G. F. Oldershaw and O. T. Williams.
3 *Influence of Copper on the Growth of Mouse Carcinoma. A. J. Gelarie.
4 Eugenics. E. Schuster, H. Campbell and J. S. Macintosh.
5 Crime and Punishment. J. Scott, C. A. Mercier and B. Donkin.
6 Hospitals in Relation to the State, the Public and the Medical Profession. B. Moore.
7 The Municipal Hospital in Germany. I. G. Gibbon.
8 The German Hospital in its Relation to the Medical Profession. W. Pfeiffer, Essen, Germany.
9 The German Hospital and German Insurance Legislation. Grober, Jena.

August 9, No. 2745, pp. 285-318

10 Medical Prognosis: Its Methods, Its Evolution, Its Limitations. A. Chauffard.
11 Realignments in Greater Medicine: Their Effect on Surgery and the Influence of Surgery on Them. H. Cushing.
12 Pellagra in Great Britain. L. W. Sambon.
13 Abscess due to Streptothrix Eppingeris Resembling a Staphylococcic Infection. W. B. Alcock.
14 Treatment of Chronic Progressive Diseases of the Spinal Cord by Roentgenotherapy. F. H. Johnson.
15 Work of the British Red Cross Society's Units with the Bulgarians. E. T. F. Birrell.
16 The Relation of Utility of Aeroplanes in Connection with Medical Services in the Field. J. D. F. Donegan.
17 Spinal Analgesia in Military Service; 600 Cases. J. W. Haughton.
18 Use of Kinesitherapy in the After-Treatment of Injuries Received in War. Durey.
19 A Proposed Light Ambulance for Yeomanry Regiments. D. G. Kannard.
20 Fungous Infections of the Glabrous Skin. H. G. Adamson.
21 Veronal Rashes; with a Note on Luminal. G. Parnet.
22 The Nature, Varieties, Causes, and Treatment of Lupus Erythematosus. J. M. H. MacLeod.

2. **General Toxic Effect of Paints.**—The authors conclude from their experiments that there is no poisonous emanation from either basic lead carbonate or basic lead sulphate, even with much more thorough exposure than would occur to painters, or occupants of a freshly painted room, under ordinary conditions. The animals were exposed within a few inches of a freshly painted surface surrounding them on all four sides and roof as well. They believe that it may be taken that true lead poisoning when it does occur arises from swallowing, inhalation as dust followed by swallowing, or absorption from skin or an abraded surface, and not from volatile emanations.

3. **Influence of Copper on the Growth of Mouse Carcinoma.**—In one series of animals a solution of a cuprammonium sulphate was injected subcutaneously into tumor mice; in the second colloidal copper was employed. Cuprammonium sulphate ($CuSO_4.4NH_3.H_2O$) was obtained by adding to a saturated solution of $CuSO_4$ strong ammonia and then boiling; the blue crystals of the curprammonium salt, which separated out on cooling, were dissolved in 0 85 per cent. NaCl solution and used for injection, the concentration of the solution employed ranging from 0.62 per cent. to 0.70 per cent. of metallic copper. The lethal dose of this salt was found to be represented by about 0.05 gm. of copper per kilogram of body weight. The injections were made subcutaneously at a distance from the tumor. Only mice with small tumors were employed for experiment, and spontaneous retrogression of mouse tumor has been in experience an excessively rare event.

The results of the experiments made with the cuprammonium sulphate: The number of injections varied from two to five. The injections, which frequently caused inflammatory swelling, sometimes leading to necrosis of the skin at the site of injection, were always made as far as possible from the tumor so as to avoid any direct effect on the growth. In three cases complete disappearance of the tumor occurred, and in two other cases great diminution in size took place. In five experiments the tumor remained stationary for periods varying from five to ten days, and in the remaining two experiments an increase in size of the tumor attended with softening took place. With a view of avoiding the local inflammatory reaction which occurs when cuprammonium sulphate is used, it was determined to employ colloidal copper for subcutaneous injection. This was observed to be slowly absorbed without producing a marked irritating effect. Colloidal copper was prepared after Bredig's method, a galvanic current of 10 amperes being allowed to pass between two thick copper electrodes immersed in a beaker containing distilled water, free from CO_2, placed in a larger vessel filled with ice. In this way a colloidal solution of copper was obtained containing 0.04 to 0.3 per cent. of copper. It was found that the colloidal solution could be boiled without precipitation occurring, and when air was excluded no change in the aspect of the liquid occurred in the course of several days. In all the experiments made, however, the colloidal solution of copper was freshly prepared.

The addition of stains, such as methylene blue, eosin, and basic fuchsin, in small quantity, was found not to precipitate copper from solution. A solution of colloidal copper is incompatible with saline solutions. A very small quantity of sodium chlorid solution, for example, causes precipitation almost immediately. It was, therefore, used in a non-isotonic solution, the injections being slowly made into the subcutaneous fascia in amounts of about 1 c.c., in several areas removed as far as possible from the tumor in order to avoid a direct effect of the copper; in some cases intraperitoneal injections were employed (1 c.c.), or both methods of injection were used. The minimal lethal dose of colloidal copper was not determined. In all thirty-two experiments were made, the number of injections in individual mice ranging from two to seven. In these experiments it was found possible to keep the animals alive a much longer time than was the case when cuprammonium sulphate was employed. Nevertheless, the number of cases in which complete disappearance of the tumor was obtained was relatively less than in the preceding experiments. In the greater number of experiments in which an effect on the tumor was observed this was manifested by the tumor becoming stationary in growth.

The effect on the implanted tumor of injection of colloidal copper was much less pronounced than when cuprammonium sulphate was used. Some of the stationary tumors were kept under observation for a very much longer period of time than in the preceding experiments. In one case the tumor remained stationary for as long as three months. In four experiments repeated intravenous injections of colloidal copper were employed. The amount of fluid injected always exceeded 1 c.c. and in one case reached as much as 2 c.c. After the latter injection the mouse became collapsed with rapid and deep respiration, subsequently recovering and surviving for forty-two days. With this exception no ill effect followed on injection. After intravenous injection the implanted tumors increased slightly in size during the next few days, and then became soft, subsequently remaining stationary. On sectioning these tumors very marked degeneration was observed. The results obtained in this and the preceding section show that by means of injection of copper-containing fluids implanted tumors in a certain proportion of cases pass into a stationary condition or undergo regression, and suggest that a similar result might be obtained in cases of spontaneous carcinoma.

Journal of Tropical Medicine and Hygiene, London

August 1, XVI, No. 15, pp. 225-240

23 A Year's Anti-Malarial Work at Khartoum. A. Balfour.

Lancet, London

August 2, II, No. 4692, pp. 273-362

24 Tuberculosis of the Urinary Tract. J. H. Evans.
25 *Fatal Illness in Children Associated with Acute Interstitial Parotitis. M. H. Gordon.
26 *Production of Ulcer of the Stomach in the Rat. C. Singer.
27 Arsenic Cancer. W. H. Nutt, J. M. Beattie and R. J. Pye-Smith.
28 New Guaiacol Chlor-Iodid Compound in the Treatment of Various Conditions. J. Maberly.
29 Laryngectomy Subsequent to Tracheotomy for Epithelioma of the Larynx. D. McKenzie.
30 Case of Lightning Stroke, Followed by Recovery. W. Gem.

August 9, II, No. 4693, pp. 363-444

31 *Value of Tuberculin in Pulmonary Tuberculosis. J. K. Fowler.
32 *Place of Tuberculin in Treatment in Relation to other Methods. W. C. White.
33 *Tuberculin Treatment. D. Sahli.
34 Electrography for Clinical Purposes. A. D. Waller.
35 Albumin Reaction in Sputum: Its Significance and Causation. H. A. Treadgold.
36 Basophile Patches in the Protoplasm of the Neutrophile Polymorphs. A. Roemmele and R. Sweet.
37 Syphilitic Infection Followed by Landry's Syndrome and Later by Tabes Dorsalis. E. D. MacNamara.
38 "Chronic Irritation" Caused by Fumes and Dust Produced in the Process of Manufacturing Tin Plates. H. C. Ross and J. W. Cropper.
39 Case of Volvulus of the Small Intestine Complicating General Peritonitis; Recovery. C. W. Cunnington.
40 Prevalence of Chronic Gastric Disease in Spain. W. A. Mackay and I. MacDonald.

25. **Fatal Illness in Children Associated with Acute Interstitial Parotitis.**—Gordon's communication is the histologic observation of an unusual lesion—parotitis—in a series of four cases under observation in the postmortem room at St. Bartholomew's Hospital during the past few months. All of the patients in question were children. All had died after a short illness in which the symptoms pointed to meningo-encephalitis. Post-mortem meningeal congestion was found in all the cases, and in two of them there was flattening of the convolutions and other evidence of increased intracranial pressure. In all alike no pus was present in the meninges. There was no evidence of tubercle in the meninges, brain or elsewhere. The cerebrospinal fluid was clear and contained an excess of lymphocytes, but no visible bacteria. Sections of the cerebral cortex and of the cord failed on microscopic examination to yield histological evidence to justify a diagnosis of poliomyelitis.

As regards the rest of the body, the lymph-nodes both in the neck and mesentery were swollen. In two cases the lymphoid tissue in the small intestine was more prominent than usual, this change being most marked in Peyer's patches in one case, and in the solitary follicles in the other. In two of the cases petechial hemorrhages were seen; in the first in the parietal pleura and visceral pericardium, and in the second on the under surface of the liver and beneath the capsule of the kidneys. In all the children both heart's blood and cerebrospinal fluid failed to show growth on agar, and their illness would have remained a mystery had it not been for the following observation: Although the salivary glands were not obviously enlarged and had given rise to no symptoms, they were found in all the four children to show on histologic examination foci of acute inflammation—chiefly interstitial in distribution. The duration of their illness had varied. In one case the child died within twenty-four hours of the onset, and clinically it was a case of "convulsions." The others died on the second, third and twelfth day respectively. The illness from which these patients had suffered presented certain features of general similarity. In point of fact, as a result of the first two cases the last two had been suspected clinically of being instances of this disease. Three out of the four patients had drowsiness as a well marked initial symptom. All developed coma. One had delirium.

In all of the cases the eyes were sunken and fixed or staring, but not to one side; their axes were parallel—that is to say, there was no squint. In all the pupils were dilated. In none was any abnormality made out with regard to the disk. All of the cases presented the symptom of muscular rigidity in some form or other. In two the head was definitely retracted, and all had some stiffness of the neck muscles. Kernig's sign was positive in three. Three of the patients had twitching and two had "fits" of more or less general muscular rigidity, in course of which they died. Babinski was present in two cases, doubtful in one, and absent in one. Three of the patients lost their knee-jerks and the reflex from their abdominal muscles. The children had a marked pallor. All of the cases had pyrexia, and all had a frequent and feeble pulse. All of them had a certain amount of vomiting and diarrhea, the stools of three of them being of a greenish color. The cerebrospinal fluid was under increased pressure. On examination an increase was found in the cells, the number counted being 50,446, and 6,800, respectively, per cm. in three of the cases. In all the cases the predominant cells in the cerebrospinal fluid were lymphocytes. As regards the blood, the leukocyte count was 11,400. A differential count showed a well marked lymphocytosis.

26. **Ulcer of the Stomach in the Rat.**—The line of experiment that ultimately proved successful in Singer's work was very simple. Rats were placed in circular earthenware jars, ten animals in each jar. At the bottom of the jars were placed wood shavings contaminated by other rats, and throughout the experiment the shavings remained unchanged. The animals were fed only on wet bread. It was always found that in the course of a few hours the bread became contaminated with fecal matter, and in a few days was also overgrown with moulds. The majority of animals dealt with in this way were found to present more or less marked gastric changes of ulcerous nature when the treatment had been

continued for a fortnight or longer. In eighty rats thus treated for ten days or more ulcers were found in fifty-seven cases, or 71 per cent., while in 200 well-kept rats that were used as controls ulcers were encountered in only sixteen cases, or 8 per cent. Experiments were also made in feeding well-kept rats on bread mixed with stale feces and on bread that had become mouldy, but negative results had been obtained. In the case, however, of fourteen well-kept rats fed once on a mixture of bread and minced intestines of other rats ulcers were found after four weeks in ten cases, or 72 per cent. The actual causative factor remained in doubt. The condition of experiment suggests an infective agent of the nature of an organism normally present in some other part of the digestive tract.

31. **Tuberculin in Pulmonary Tuberculosis.**—The use of tuberculin in any form in the treatment of pulmonary tuberculosis, Fowler says, is not free from danger. Even with exceedingly small initial doses which are gradually increased the limit of tolerance may be suddenly reached and a reaction may occur. Its use is absolutely inadmissible in any case in which there is fever. Fever is the guide to the activity of the disease, therefore, the rôle of any remedial agent which can only be employed in afebrile cases is necessarily very limited. General reactions should be avoided. If one occurs the treatment should at once cease. To continue tuberculin injections with increasing doses in spite of reactions is unjustifiable and dangerous to the life of the patient. Focal reactions are also dangerous, as they cannot be controlled. They may also occur in the neighborhood of obsolete lesions, such as it is the object of all treatment to produce. Fowler has reported a case in which, under treatment with old tuberculin a patient expectorated four calcareous particles, one of which was surrounded by pigmented lung tissue, and also a small portion of lung tissue. Subsequently signs of excavation appeared at the apex of one lung. Calcareous particles are "sleeping dogs" which should not be disturbed. The treatment likely to be attended by the best results should follow the lines of rest and exercise originated by Dr. Otto Walther at Nordrach, and further developed by Dr. Marcus Paterson at the Frimley Sanatorium of the Brompton Hospital.

32. **Tuberculin in Treatment in Relation to Other Methods.**—White believes fully in tuberculin as an aid to treatment in tuberculous cases. He is himself a subject of tuberculosis and has for seven years taken tuberculin in some form or dose at least every two weeks, probably in all over 500 doses. It has done him no harm that he is conscious of. On the other hand he has been sure that it has done him great good when he has taken enough at one time to produce in his body a mild reaction. In small doses he has never been able to notice the slightest influence. White has now watched many patients who have taken tuberculin steadily for periods varying from two to five years—cases of tuberculosis of the eye, of bones, of glands, of skin and throat—and the improvement in many cases of them was due to tuberculin and to tuberculin mainly. However, the last dregs of the disease are always very hard to remove, and there is probably some other factor, he says, which we have not yet learned which must be added to tuberculin before we have a real specific for this disease.

33. **Tuberculin Treatment.**—Sahli is an ardent advocate of the tuberculin treatment and gives fifteen propositions in support of his position: All the various tuberculins are essentially identical. The apparent differences are dependent on the various degrees of admixed impurities. The active principle of all tuberculins is the protein of the tubercle bacilli. There is no proof of the existence of a tuberculin exotoxin. The fact that it is impossible to produce high sensibilization for tuberculin by previous tuberculin injection in healthy animals is no argument against tuberculin being actually the toxin of tuberculosis. The best tuberculins are those prepared from cultures as free as possible from adventitious albumins. To avoid disastrous mistakes in the therapeutic dosage it is advisable to provide the practitioner with tuberculin in suitably graduated dilutions. The use of tuberculin for diagnostic purposes ought to be condemned. It is unreliable both positively and negatively. Diagnostic injections are dangerous. The only diagnostic procedure Sahli advises is the cutaneous reaction with graduated dilutions. Its purpose is not diagnosis in the ordinary sense, but the determination of tuberculin sensibility in order to fix the proper initial dose for treatment. Tuberculin treatment is free from danger only if more obvious clinical reactions are avoided. In advanced cases tuberculin treatment may sometimes produce a certain symptomatic effect, but this effect does not compare with the utility of tuberculin in incipient cases.

In order that tuberculin treatment should be widely available for the most favorable incipient cases, it is indispensable that the general practitioner, and especially the family physician, should render himself proficient in tuberculin treatment. Correct tuberculin treatment is only possible if based on a solid and thorough knowledge of the action of tuberculin. The theory of the therapeutic action of tuberculin may now be regarded as well established. Tuberculin acts favorably only in cases where the human organism is not already sufficiently under the influence of absorbed tuberculin; that is, generally in slighter cases. It is not necessary to increase the doses of tuberculin to the furthest limit of tolerance. Many cases improved more with a much smaller dose. This optimum dose ought not to be overstepped. The large doses of tuberculin recommended recently for the purpose of reducing temperature have no curative action. Tuberculin has not the character of a true immunization, though it produces immunizatory effects in the organism. All localized tuberculosis is suitable for tuberculin treatment, provided that the patient's system is not already overloaded with tuberculin, and he is, therefore, too seriously ill. As a rule acute cases cannot be treated by tuberculin.

Tuberculin by means of multiple cuti-reactions after the method described by Sahli at the International Congress on Tuberculosis in Rome, 1912, has been proved harmless, and especially for incipient cases. It is based on the principle of enlarging the reactive surface. The strongest local (cutaneous) reaction is produced with the smallest amount of tuberculin. Well-diluted tuberculin treatment constitutes a real and great therapeutic progress.

Archives Générales de Chirurgie, Paris

July, VII, No. 7, pp. 769-896

41 Congenital Scoliosis Connected with Deformed Vertebra. L. D. Chambardel.
42 Firearm Wounds of the Chest. (Plaies thoraciques par armes à feu pendant la guerre Italo-Turque.) F. Caccia.
43 Cancer of the Breast with Calcareous Concretions. (Le cancer psammeux du sein.) T. P. Tourneux and Bassal.

Archives des Maladies du Cœur, etc., Paris

August, VI, No. 8, pp. 497-560

44 Neuromuscular Heart Block; Three Cases. (Dissociation auriculo-ventriculaire d'origine neuro-musculaire.) A. Souques and D. Routier.
45 Sclerosis of Pulmonary Artery Secondary to Certain Chronic Lung Conditions. (Cardiaques noirs.) F. C. Arrillaga.

Presse Médicale, Paris

July 30, XXI, No. 62, pp. 625-632

46 *Percussion Sign of Typhoid Fever. (La submatité de la base droite—submatité rétrohépatique—signe de fièvre typhoide.) C. Lesieur and J. Marchand.
47 Malformation in Palate, etc., as Affecting Development of the Teeth. (Quelques mots d'orthodontie à l'usage des médecins.) L. Frey.

46. **Percussion Sign of Typhoid Fever.**—This sign was described in The Journal, March 30, 1912, p. 979. Lesieur and Marchand now have a record of 150 cases in which the test for it has been applied. In eighteen the findings were negative and the cases proved to be not typhoid. In one case there was no localization of the typhoid in the intestines, the symptoms being meningeal and septicemic, but the percussion sign was positive and thus was the guide to the diagnosis, confirmed by the course of the case. The sign

is seldom positive in the later stages of the disease and it was never encountered in other infectious diseases. The reappearance or persistence of the sign after the temperature has returned to normal warns of impending relapse. The sign is an area of relative dulness on superficial percussion of the right base of the thorax. It is not to be found on the left side, and, if there are no lesions in the pleura or lungs to explain it, this dulness may be accepted as differentiating typhoid. They regard the dulness as the expression of the exaggerated antitoxic function of the liver in typhoid. No other infectious disease seems to affect the liver and the rest of the biliary apparatus to such an extent as typhoid.

Semaine Médicale, Paris

August 6, XXXIII, No. 32, pp. 373-384

48 Professional Secrecy in Matters Involving Workmen's Compensation. (Le secret professionnel en matière d'accidents du travail.) M. Bourdon (Conseiller à la Cour de cassation).

Berliner klinische Wochenschrift

July 28, L, No. 30, pp. 1381-1420

49 *Acute Articular Rheumatism. (Pathogenese des akuten Gelenkrheumatismus.) W. Weintraud.
50 *Exercise in Treatment of Circulatory Disturbances. (Die Bewegungskur bei Kreislaufstörungen.) E. Zander, Jr. (Stockholm).
51 Symbiosis of Plants with Bacteria. (Einige Fälle von Symbiose höherer Pflanzen mit Bakterien.) W. Benecke.
52 Feeding through Duodenal Sound. (Dauerernährung mittels der Duodenalsonde.) P. Lazarus.
53 Roentgenoscopy of a Woman whose Stomach and both Vagus Nerves had Been Resected. M. Cohn.
54 Operative Cure of Tumor in Gasserian Ganglion. B. Sachs and A. A. Berg (New York).
55 *Saphenofemoral Anastomosis in Treatment of Varices. M. Weichert.
56 *Test for Iodin in Urine. R. Ehrmann.
57 *Serous Meningitis in Puerperium Simulating Brain Tumor; Recovery. (Ueber einen im Wochenbett unter dem Bilde eines Hirntumors mit Ausgang in Heilung aufgetretenen Krankheitszustand.) A. Pelz.

49. **Pathogenesis and Treatment of Acute Articular Rheumatism.**—Weintraud presents arguments to sustain the assumption that the parenteral passage into the blood of bacterial proteins or of substances originating under the influence of the bacteria, create conditions of anaphylaxis. The parenteral penetration into the system of the bacterial proteins thus sensitizes the organism, and a special affinity of these proteins for the joints or the heart may lead to a special local sensitization. The specific reaction soon dies out, but new generations of bacteria repeat the process. Other bacteria may then get in their work as a complicating secondary infection. This conception of the origin of acute articular rheumatism throws light on the treatment, Weintraud continues. All the drugs which are known to be effectual in acute articular rheumatism are mild narcotics for the sensory functioning of the brain. It is certainly remarkable that the drugs with most effectual action are those which attenuate the sensory impulses from the joints. Some of them are actual anesthetics for the joints. We know that the outbreak of the symptoms accompanying the anaphylactic reaction in animals can be entirely prevented by general anesthetics (ether, ethyl chlorid, etc.). There is also much research on record which shows that the phenomena of inflammation, otherwise inevitable, do not occur if the sensory impulses from the region are attenuated or entirely suppressed.

50. **Gymnastic Exercises in Circulatory Disturbances.**—This address by E. Zander, Jr., was the principal one at the recent physiotherapy congress at Berlin. He declares that the method of therapeutic exercises, Swedish movements, etc., is of long tried efficiency, but that the theories with which its effects have been explained have been outgrown. A new theory must be built up; it must be based more on the biologic effect than the mechanical; more on the after-effect than on the action at the time; more on the effect on the periphery than on the center. In other words, the main task of therapeutic exercises is to draw on and train the muscles and the lungs in the task of compensation.

55. **Saphenofemoral Anastomosis in Treatment of Varices.**—Weichert has applied Delbet's technic slightly modified in five cases, in two on both sides. The results were less favorable than anticipated. All the patients were improved, but not to the hoped-for extent. The mediocre effects realized were out of all proportion to the severity of the operation.

56. **Test for Iodin in Urine.**—Ehrmann uses substances which practitioners are liable to have already on hand. About 2 c.c. urine are placed in a test-tube; 1 c.c. of dilute hydrochloric acid is poured into the tube and then 0.5 c.c. of commercial hydrogen dioxid (3 per cent.). The iodin released is shown up by addition of 1 c.c. toluol or 1 c.c. chloroform and the whole shaken up. A red layer of toluol floats on top, or there is a deep red layer of chloroform beneath.

57. **Serous Meningitis in the Puerperium Simulating Brain Tumor.**—Pelz reports the case of a young, otherwise healthy woman in an apparently normal puerperium, who suddenly developed headache, vertigo, vomiting, apathy and other signs of a brain tumor, the pulse 44, choked disk, the cerebrospinal fluid under high pressure, but no localizing symptoms. Then followed a stage of general convulsions, agraphia and apraxia, but improvement soon became manifest and the cure was complete in four or six weeks. Oppenheim reported a similar case with necropsy, and Nolen has published a case in which the same syndrome developed at the twelfth pregnancy and returned at the fourteenth and fifteenth, but the woman recovered. There can be no doubt of the connection between this periodically recurring, tumor-suggesting syndrome and the pregnancy or puerperium. The trouble is evidently a serous meningitis due to some intoxication connected with the pregnancy. We must not be too hasty to ascribe the recovery to decompressive operations in such cases. If an operation had been done in any of the above, the improvement would certainly have been attributed to it. A decompressive trephining was contemplated in Pelz' case but was constantly postponed. This patient had a history of intense headache, during her first childbed, coming on suddenly and persisting.

Correspondenz-Blatt für Schweizer Aerzte, Basel

August 2, XLIII, No. 31, pp. 961-992

58 *Diagnosis of Perforated Gastric Ulcer; Six Cases. (Zur Diagnose des plötzlich in die freie Bauchhöhle perforierenden Magengeschwüres.) H. Ryser.

58. **Differential Diagnosis of Perforating Gastric Ulcer.**—Ryser's patients were three men of 22, 39 and 48 and three women of 46 to 63. The perforation was surrounded by indurated tissue, showing that the ulcer was of the callous type, boring deep, in all the cases. Sudden intense pain was the first symptom but there was actual collapse only in two of the cases. In most cases the pain and tenderness are at the seat of the perforation but other patients refer the pain to the ileocecal region, misleading the physician to assume appendicitis. This occurs when considerable stomach content has escaped through the perforation and has spread downward. Vomiting seldom occurs as the vomiting movements of the stomach force the contents through the perforation instead of up to the mouth. The physician finds the patient generally in bed, lying motionless on his back, in great distress from the pain. The face is pale and covered with cold sweat. Later, patches of red may be seen in the face and the extremities are cyanotic, showing that the organism is suffering severely from the intoxication. In two of his cases the pulse kept good and strong for several hours; in the others it grew fast and small at once. The temperature may be normal or above or below. The breathing is rapid and shallow. In one case hiccough came on in a few hours. A history of gastric trouble suggesting ulcer is a great aid in differentiating, as also the boat-shaped retraction and rigidity of the abdominal wall. If only a small amount of stomach content escapes the abdominal wall may not grow rigid, but in his cases the rigidity was pronounced or could be elicited by light pressure on the abdomen. The liver dulness was normal in three cases, much reduced in one case, normal at first but absent

an hour later in another, and in the sixth there was no area of dulness over the liver. A perforating appendix never causes such intense pain from the start, and the rigidity is more apt to be restricted to that half of the abdomen. A ruptured pyosalpinx in another case simulated the picture of a perforated gastric ulcer, especially as the young woman had long suffered from dyspepsia and had even taken a course of treatment for gastric ulcer, while there was no history of gynecologic trouble. The operation revealed the stomach intact.

Deutsche medizinische Wochenschrift, Berlin

July 24, XXXIX, No. 30, pp. 1441-1488

59 Combined Treatment of Syphilis. (Ueber die Heilung der Syphilis durch die kombinierte Salvarsan-Quecksilberbehandlung.) W. Scholtz and E. Riebes.
60 Psoriasis is a Clinical Entity. (Ist die Psoriasis ein Symptom chronischer Infektionskrankheiten—Tuberkulose, Syphilis?) W. Schoenfeld.
61 *Serotherapy of Skin Diseases. (Ueber Serumbehandlung von Hautkrankheiten.) G. Stümpke.
62 *Artificial Light in Treatment of Surgical Tuberculosis. R. Hagemann.
63 Perception of Light and of Colors. (*Vergleichende Untersuchungen über den Licht- und Farbensinn.*) F. W. Fröhlich.
64 *Influence of Experimental Thymectomy on Growth. (Ueber die Thymusdrüse.) K. Basch.
65 Pathology of the Knee. F. Bähr.
66 *Pyelitis and Otitis Media in Infants. F. Glaser and H. Fliess.
67 Rhinoliths. (Zwei bemerkenswerte Fälle von Nasensteinen.) O. Heinemann.

61. **Serotherapy of Skin Diseases.**—Stümpke has been applying transfusion of serum or whole blood in quite a number of cases and obtained very favorable results in itching eczema, in lichen ruber planus and herpes gestationis and in urticaria, while the results were sometimes good and sometimes negative in parasitic eczema, pemphigus and psoriasis. Some of the cases had proved refractory to all other measures. The favorable effect was realized only in the skin affections with a general cause and not of purely local origin. As a rule, he injected on an average 20 or 25 c.c. of serum after defibrination and centrifugation of the blood, repeating the infusion two or three times at intervals of from three to five days.

62. **Artificial Light in Treatment of Surgical Tuberculosis.**—Hagemann's article issues from König's clinic at Marburg and a communication from König, himself, was recently summarized in these columns July 26, 1913, p. 314, bearing on the same subject, namely, the fine results obtained with the mercury quartz lamp, exposing the whole body as in Rollier's method of utilizing the direct sunshine in the Swiss mountains. Hagemann emphasizes that the results with this artificial sunlight are so good and the method is so cheap and easily applied anywhere, without the necessity for long sojourns away from home, it permits the poorest to have the advantage of the therapeutic application of the chemical rays.

64. **The Thymus Gland.**—The untimely death of Karl Basch put an end to the important researches of which this is his last report. It is illustrated and shows the great difference in development between puppies of the same litter when the thymus was removed from some of them. The results demonstrate further that the thymus is involved not only in the growth of the bones and the eyes and in the excitability of the nervous system, but that it has some close connection with the lymph system.

66. **Otitis Media and Pyelitis in Infants.**—Glaser and Fliess have encountered three cases which have convinced them that otitis media is extremely liable to accompany pyelitis or precede it, and should be suspected even when there are no manifest signs of ear trouble whenever the fever keeps high. In one case the colon-bacillus pyelitis was evidently a complication permitted by the general debility resulting from the unsuspected otitis media; the child recovered its health after paracentesis and the cure of the otitis. They reiterate that when an infant has fever although it seems to be explained by discovery of pyelitis, yet the greatest attention should be paid to the ear. Otitis media may be the primary trouble even although there are no signs of it to be detected, no bulging of the drum, no redness and no tenderness in the mastoid. If the membrane shows any signs of redness they urge to incise it at once. The pyelitis in such cases is merely secondary, the result of mixed infection.

Medizinische Klinik, Berlin

July 27, IX, No. 30, pp. 1191-1232 and Supplement

68 *Sweating Procedures in Internal Medicine. (Bedeutung von Schwitzkuren.) A. Schwenkenbecher.
69 Gynecology and Psychiatry. O. Bumke.
70 *Anesthesia at Delivery. (Narkose und Anästhesie bei Geburten.) H. Fuchs.
71 *Multiple Sclerosis. (Eine praktisch und theoretisch wichtige Verlaufsform der multiplen Sklerose.) R. Brandt and S. Auerbach.
72 Hemorrhage after Abortion and Delivery. (Blutung post abortum et post partum.) M. Schechner.
73 Physical Measures in Treatment of Chronic Bronchitis and Emphysema and the Secondary Circulatory Disturbances. A. Haupt.
74 Mineral Mud and Other Baths in Gynecology. (Ueber die Bäderbehandlung der weiblichen Sterilität.) O. Daude.
75 *Mode of Action of Saline Purgatives. (Wirkungsweise salinischer Abführmittel.) Best.
76 Treatment of Heart Disease. (Zur Therapie bei Herzkranken.) G. Liebermeister.
77 Radiology of the Stomach. (Neuere Ergebnisse der Radiologie des Magens.) Hurter.

68. **Sweating Procedures in Internal Diseases.**—Schwenkenbecher concludes his remarks on this subject with the statement that the systematic use of hot water baths may prove a great help in various diseases. The baths can be modified as to the amount of water, the temperature and the duration of the bath so as to adapt them to a delicate constitution and a weakened circulatory system. In kidney disease the sweating procedure diverts the fluid from the edema to the skin, and thus benefits, but the assumption that large amounts of nitrogen and chlorids can be eliminated in the sweat is not justified by the facts. Although a little more is thus eliminated in the sweat of nephritics than of healthy persons, yet the total is comparatively small. Even an energetic sweating bath cannot wash out more than 1 gm. of nitrogen and 2 gm. of sodium chlorid in this way, and in the individual case the question must be thoroughly studied whether this compensates for the demands made on the system by the sweating procedure. Hot local baths, hot baths for the feet or hot packs for the trunk in case of uremic headache and nausea, often have a marked influence on the symptoms of nephritis. But even with these it is of the utmost importance, as with all sweating procedures, to see that enough fluid is ingested or supplied in some way to take the place of that lost in the sweat. It may be wise also to place a cooling appliance on the heart. He says that bacteria can pass from the blood into the sweat, but that this occurs extremely rarely. He thinks that in syphilis sweating procedures are not applied as often as they should be for the tertiary, torpid syphilids of the skin and mucous membranes, and torpid bone lesions. Baths facilitate the mercurial inunctions. On the other hand, he warns emphatically against sweating procedures in syphilitic nervous affections, as they are liable to aggravate them. He remarks that in applying heat or hot baths in treatment of chronic arthritis the intensity of the heat applied is an important factor in the results; the action is more rapid and more intense the hotter the bath. Baelz has called attention to the fact that certain thermal springs with a temperature of 54 C. are the most effectual of all in Japan in the treatment of chronic joint disease.

70. **Anesthetic for Delivery.**—Fuchs relates a number of experiences which sustain his general conclusion that up to the present no means is known of rendering delivery painless which is not fraught with some danger. He says of the scopolamin "twilight sleep" that it is so dangerous for the respiration center of the fetus that he has abandoned it entirely. In his service one otherwise normal child succumbed evidently to the "scopolamin trauma" alone, and three others were born with lagophthalmos, cyanosis, sluggish pupils and very slow respiration, but these three children finally threw off the effect of the drug after a week of som-

nolency, taking scarcely any nourishment. He cites a case to show the medicolegal complications possible when a woman is delivered during the "twilight sleep": When the woman returned to full consciousness and found twins beside her, she refused to accept the two infants as her offspring. The accusation of changing the children while the mother is unaware of what is going on is also within the possibilities.

71. Onset of Multiple Sclerosis with Visual Disturbances.—Auerbach and Brandt call attention to their experience with a group of fourteen cases in which the first signs of anything wrong were visual disturbances, headache and dizziness. Although vision was much reduced, the ophthalmoscope revealed little if anything abnormal, and the visual disturbances gradually subsided. In 80 per cent. of the cases only one eye was affected. Moving the eyeball around and pressure on it elicited pain. The periphery of the field of vision was not altered but there was almost absolute scotoma for red and green and relative for white. The diagnosis was retrobulbar neuritis, and under mild inunctions and sweating procedures vision returned to normal in three or four weeks in the majority. In about 12 per cent. of the cases optic atrophy developed and the papilla was blanched even in the cases with good functional outcome. Neurologic examination revealed in nearly every instance symptoms suggesting incipient multiple sclerosis, including nystagmus, intention tremor and modification of the reflexes, but no tendency to scanning speech, tenesmus or disturbance in the gait. Fleischer has reported that among forty-two cases of retrobulbar neuritis. this proved in 66 per cent. to be the first symptom to attract attention to oncoming multiple sclerosis. This was the case in 45 per cent. of the thirty-seven cases of retrobulbar neuritis reported here. Some of the patients were kept under supervision and there was an interval of years, up to fifteen years, before the multiple sclerosis induced very serious symptoms. In many instances three to six years afterward the patients were still able to attend to business. The cases commencing with visual disturbances seem to have an unusually protracted course. Auerbach and Brandt add that a recent letter from Miura of Japan confirms the rarity of multiple sclerosis in Japan. Miura has never encountered it in the thousands of necropsies at his institute. They state further that they have been told that the western coast of America seems also to be free from it; in any event, it is far less common in America than in Europe.

75. Salt Solution as a Purgative.—Best reviews his experiences with some dogs with Pawlow fistulas. The results also show, he says, that physiologic salt solution passes through the gastro-intestinal tract without irritating it or interfering with osmotic conditions, while there is nothing he knows of which is passed along so rapidly. His clinical experience confirms these experimental findings. He had patients drink two glassfuls of a 0.9 per cent. solution of sodium chlorid, twenty minutes before breakfast. After nine or twelve minutes defecation followed. The stomach expels the salt solution remarkably promptly, setting up peristalsis throughout the intestinal tract. In the dogs 1 liter of the salt solution passed entirely through the alimentary tract and was expelled in thirty minutes, unless the animals were thirsty; in this case part of the fluid was absorbed. The larger the amount ingested the more rapid the passage. Most mineral waters are hypertonic and are absorbed in the duodenum unless large quantities are taken. The accumulation of the fluid in the lower bowel has a purgative influence and this is supplemented by the peristalsis reflex emanating from the stomach. After drinking the salt solution on an empty stomach in the morning he has the patient follow it with a cup of coffee or other appetizing drink. With atony of the stomach, the rapid expulsion of the physiologic salt solution makes it the only regulator of the bowels to use, he declares.

Münchener medizinische Wochenschrift

July 29, LX, No. 30, pp. 1641-1696

78 *Serodiagnosis of Bovine Tuberculosis. (Ueber die Verwendbarkeit der optischen Methode und des Dialysierverfahrens bei Infektionskrankheiten. Untersuchungen über Tuberkulose bei Rindern.) E. Abderhalden and P. Andryewsky.
79 Serodiagnosis of Abnormal Thymus Is Practicable. (Gelingt es mittels der Abderhaldenschen Fermentreaktion, den Nachweis eines persistierenden oder hyperplastischen Thymus zu führen?) K. Kolb.
80 Serodiagnosis of Cancer and Pregnancy. (Die Diagnose der bösartigen Neubildungen und der Schwangerschaft mittels der Abderhaldenschen Methode.) G. v. Gambaroff (Moscow).
81 *Ileus and Appendicitis. W. Wiegels.
82 *Seasickness and Vagotony. J. Fischer.
83 *Treatment of Burns. (Ueber Verbrennungen, nach Rovsings Methode behandelt.) O. Wulff.
84 Application of Pressure and Suction in Various Fields of Medicine. (Druck- und Saugbehandlung in der ärztlichen Praxis.) F. Kirchberg.
85 *Albuminuria and Hematuria after Hexamethylenamin. (Ueber ungünstige Wirkungen des Urotropins.) W. Cuntz.
86 Treatment of Granulating Wounds. A. Wittek.
87 Hereditary Chorea. (Kasuistischer Beitrag zur Chorea chronica hereditaria.) M. Goldstein.
88 Typical Injury of Middle Condyle of the Femur. P. Ewald.
89 Syphilitic Pernicious Anemia. J. Weicksel.
90 Negative Pressure in Long Bones of Dogs. (Ueber negativen Druck in den langen Röhrenknochen des Hundes.) M. Rothmann.

78-80. Abderhalden Serodiagnosis in Infectious Disease, Etc.—Abderhalden and Andryewsky report experiences which suggest the possibility of diagnosing infectious diseases by means of the optic and dialysis biologic method, possibly also determining the special organs involved. The question is now to learn whether the defensive ferments involved are an aid or detriment to the organism. They possibly may be instructive for the prognosis. Their presence indicates at least that the organism is defending itself. The response to the test after injection of tuberculin may prove especially important in testing cattle. This communication deals principally with the application of the test to bovine tuberculosis. A negative response was constantly obtained in healthy animals (50), positive in fifteen experiments after injection of a suspension of killed tubercle bacilli, as also in eight cases in which healthy animals had developed experimental tuberculosis.

Gambaroff reports from Moscow forty-eight cases of cancer and thirty-seven other cases in which the Abderhalden technic was applied, including twenty-two pregnant women and ten normal persons. The tabulated details show remarkable concordance, constantly negative responses in the normal serum and constantly positive in all the others, with the single exception of a syphilitic who gave a positive cancer reaction.

81. Ileus and Appendicitis.—Wiegels reports nine cases in which the ileus developed in consequence of appendicitis although in some of the cases the interval since had been many years, up to seventeen in one instance.

82. Seasickness and Vagotony.—The condition of atony of the vagus nervous system, called "vagotony" by Eppinger and Hess, was mentioned in The Journal August 16, 1913, p. 520, abstract 80. Fischer calls attention to the remarkable similarity or identity of the symptoms of seasickness with those of typical vagotony, and urges treatment of seasickness on the principles which have been found effectual in treatment of vagotony, that is to say, injection of atropin. He describes extensive experiences on a stormy passage across the Atlantic last winter. He found that persons with the signs of vagotony were more liable to develop seasickness than others. In fifty-two severe cases of seasickness he gave a subcutaneous injection of atropin in a dose of 0.001 gm. to men and 0.00075 gm. to women. All the symptoms of seasickness had generally disappeared by the end of three or four hours, only in very exceptional cases was a second injection necessary. In one group of eight very seasick persons given the injection, all felt entirely well the next morning except two who were only much improved, while a similar group not given any treatment had their seasickness continue unmodified. The harmlessness of the atropin in this dose, he says, is beyond question. By the mouth a good effect was apparent in thirty cases, but it was less pronounced and slower in developing. The dose by the mouth was twenty drops of a 1 per thousand solution. He explains how nearly all the symptoms of seasickness can be traced to irritation of the vegetative nervous system, and this he ascribes to the movements of the boat.

83. This is the same article as the one reviewed in Abstract 138 below.

85. **By-Effects of Hexamethylenamin.**—Cuntz warns that this drug (urotropin) cannot be regarded as absolutely harmless. With the usual dosage he has witnessed hematuria and albuminuria develop in two cases. In the first the bladder was evidently seriously irritated; in the second case albuminuria, leukocytes and epithelial cells were found in the urine after administration of hexamethylenamin, subsiding on suspension of the drug and returning on its resumption.

Petersburger medizinische Zeitschrift

July 28, XXXVIII, No. 14, pp. 163-174

91 *Febrile Abortion. (Bericht über 593 Aborte mit spezieller Berücksichtigung der Therapie des fieberhaften Aborts.) A. Waeber.
92 *Uterine Cancer in the Riga District. (Zur Statistik des Karzinoma uteri.) B. Herzfeld.

91. **Treatment of Abortion.**—Waeber states that in 90.4 per cent. of the 593 cases of abortion reported the women had normal temperature throughout, while 9.6 per cent. had fever after evacuation of the uterus. The total mortality was 0.67 per cent., but in only one case was the fatality due to infection from the genital organs and in this case the abortion had been induced by the woman herself with a nail. He makes a practice of clearing out the uterus at once, and all the patients in the uncomplicated cases recovered. He says that bacteriologic findings are of no moment, for almost any of the germs in the vagina are liable to become virulent under favoring conditions, and that there are only two signs of unusual virulence which can be depended on, namely, when one of the germs crowds out all the others in the cultures, and when the germs in the blood proliferate so rapidly that the blood looks as it if were laked.

92. **Cancer of the Uterus.**—Herzfeld states that in ten years at the dispensary connected with the city hospital at Riga (Russia) the uterine cancers formed 1.9 per cent. of the 7.947 cancer cases in women and the operability was 37.2 per cent. up to 1909. Since that date it has been over 47 per cent., showing that the systematic campaign of education then started is beginning to have some effect. In addition to the above, there were 195 with uterine cancer among the 3.939 cancer cases admitted to the hospital. Of the total material, 4.2 per cent. were in women between 20 and 30; 8.9 per cent. between 60 and 70, and 2.1 per cent. between 70 and 80. Most of the women had borne four or five children, but in 8.7 per cent. the women were nulliparae or virgins. The latter group includes two women under 30. In the inoperable cases the first signs of trouble had been noticed two weeks up to a year before in the majority, but in four cases the interval had been from two to ten years.

Therapeutische Monatshefte, Berlin

August, XXVII, No. 8, pp. 549-616

93 The Newer Proprietary Hypnotics. (Klinische und experimentelle Grundlagen der Schlafmitteltherapie.) A. Gregor.
94 *Treatment of Burns. (Behandlung der Verbrennungen.) S. C. Beck.
95 *Conservative Treatment of Scarlatinal Abscesses. (Ueber konservativ behandelte periaurikuläre, subperiostale Abszesse bei Scharlach.) Sörensen.
96 Slight Pharmacologic Action of Cereus grandiflorus. A. Grober.

94. **Treatment of Burns.**—Beck believes in keeping the surface moist to promote secretion and elimination. This renders disinfection of the burned area superfluous. He cuts off the blister epidermis and places the patient in a tepid bath for from five to thirty minutes. He is then returned to bed and the burned area is covered with several thicknesses of gauze dipped in a 1 to 4,000 or 3,000 solution of potassium permanganate, with rubber tissue or oiled silk over this. Every thirty minutes the impermeable covering is raised and fresh tepid permanganate solution is poured on the gauze, which is otherwise left undisturbed. When the general condition permits, he has the patient placed twice a day in a large bath tub of tepid water in which about 6 or 8 gm. of the permanganate has been dissolved. The dressing is not removed beforehand; it comes off of itself in the water. The patient is left in the bath for thirty or forty minutes if the heart permits. Beck gives heart tonics as needed and supplies fluids copiously internally. In the severe cases he allows no food but milk in small, frequent amounts. This treatment with wet dressings is kept up until the temperature is normal or nearly normal and the general condition manifestly improved. Then the area is treated with salve to hasten the healing.

95. **Conservative Treatment of Scarlatinal Abscesses.**—Sörensen states that an abscess developed near the ear in fifty-three of the 4,000 scarlet-fever patients at the Copenhagen Hospital. Treatment was by incision down to the bone, drainage, and rinsing out, with or without instillation of dilute iodin-potassium iodid solution and a cotton dressing. Of the fifty-two children treated in this way—fifty-seven abscesses—none died, although the scarlet fever in these cases had been of an unusually severe type and there were numerous other complications. In 100 cases at another institution in which radical operative treatment was applied, the mortality was 9 per cent. The general condition was good in 88.5 per cent. of Sörensen's cases with conservative treatment. The details of the more typical cases are given. Only three of the total number required a radical operation later.

Virchows Archiv, Berlin

CCXIII, No. 1, pp. 1-158

97 Encapsulation of Tuberculous Foci in the Liver. H. Jenny.
98 Digestive Diseases of Laboratory Animals. S. Saltykow.
99 Studies on Circulation. H. Ribbert.
100 Pathological Changes in Aorta of Horse not Analogous to Human Arteriosclerosis. (Pathologische Veränderungen der Aorta beim Pferde in Verbindung mit der Lehre der Atherosklerose beim Menschen.) W. D. Zinserling.
101 Alcoholic Cirrhosis of the Liver. M. Schafir.
102 Metastatic Carcinoma of the Prostate Simulating Lymphomatosis. C. Lungsgaard.
103 The Blood Platelets in Thrombosis. (Zur Frage der Thrombose.) R. Hanser.
104 *Changes in the Hypophysis in Diphtheria. G. Creutzfeldt and R. Koch.
105 New Formation of Skin over Myelomeningoceles. (Ueber nachträgliche Ueberhäutung von Myelomeningozelen.) M. R. Bonsmann.
106 Structure of Congenital Goiters. N. Krasnogorski.
107 Changes in the Myocardium in Epinephrin Poisoning. N. Anitschkow.

104. **Changes in the Hypophysis in Diphtheria.**—Creutzfeldt and Koch find that the circulation frequently fails in diphtheria before there are any clinical signs of change in the heart, and that on autopsy the heart lesions are frequently insufficient to account for the severe atony of the vascular system. They believe that the hypophysis is partly responsible for this atony, and their belief is confirmed by the marked rise in blood-pressure brought about by hypophysis extract. In seven cases of death from heart involvement in diphtheria, they found profound changes in the pars intermedia of the hypophysis. These same changes were produced in guinea-pigs by the injection of pure cultures of diphtheria bacilli. A combined epinephrin-hypophysis extract therapy should be used in cases of diphtheritic heart involvement.

Zentralblatt für Chirurgie, Leipsic

August 2, XL, No. 31, pp. 1209-1248

108 Nail Extension for Fractures. (Zur Technik der Steinmann'schen Nagelextension.) F. Steinmann, D. Kulenkampff and Petzsche

Zentralblatt für Gynäkologie, Leipsic

August 2, XXXVII, No. 31, pp. 1141-1180

109 *Cure of Uterine Cancer by Exploratory Curetting. (Heilung von Karzinom durch Probeauskratzung.) C. H. Stratz.
110 Bactericidal Action of Mesothorium. O. Bondy.
111 *Aseptic Means to Introduce Hand into Uterus. (Vorrichtung zur aseptischen Einführung der Hand in den Uterus.) R. Roosen.
112 *Torsion of Myomatous Uterus. H. Poth.

109. **Cure of Uterine Cancer by Exploratory Curetting.**—In the case to which Stratz refers, the exploratory curetting in

1886 revealed cancer but for six or eight years there were no further signs of cancer on repeated exploratory curetting, done every two years at the patient's request. The curet finally revealed microscopic cancer and vaginal hysterectomy followed at once, but not a trace of cancer could be discovered in the uterus. It seems evident that on both occasions the curet accidentally happened to remove all the cancer cells there were. In the similar case recently reported by Hess, with no sign of recurrence during the five years to date, hysterectomy may yet become necessary.

111. **Aseptic Means to Introduce the Hand into the Uterus.**—An open bag of rubber and an outer open bag of linen are both fastened to a wire ring about 10 cm. in diameter. The hand grasps the rubber bag inside the linen and the linen is drawn back over the hand like a cuff while the ring catches at the vulva and the hand pushes up the rubber bag inside and finally works through it as the cervix is reached. The surface of the rubber bag does not come in contact with the vulva at all, and the hand does not emerge from the bags until just ready to enter the uterus. An illustration of the contrivance is given.

112. **Torsion of Myomatous Uterus.**—In Poth's case a virgin of 56 had known for twenty-one years that she had a pelvic tumor, but as it had caused no disturbance she did not heed her doctor's advice to have it out. Five years after the menopause her abdomen began to enlarge and suddenly symptoms as of acute peritonitis developed. The pains increased after two days and the objective findings suggested torsion of an ovarian tumor but the uterus was found to be the organ involved. There was one quite large and two small myomas; the whole uterus weighed 3,750 gm. and it had twisted completely around. Poth knows of only eighty-two cases of the kind on record; in Kynoch's case the myomatous uterus weighed over 16 pounds and had twisted two and a half times around.

Gazzetta degli Ospedali e delle Cliniche, Milan

July 24, XXXIV, No. 88, pp. 911-918

113 Industrial Accidents and Resulting Diseases and Workmen's Compensation. (Misura della guaribilita ed indennita relativa dei morbi dipendenti da infortunio sul lavoro.) G. M. de' Luna.

July 29, No. 90, pp. 935-942

114 *Prostatectomy. B. Cimino.

July 31, No. 91, pp. 943-950

115 Subphrenic Abscess after Appendectomy. (Di alcune forme di ascesso sotto-diaframmatico post-operatorio.) M. Fasano.

August 3, No. 92, pp. 951-966

116 *Hyperglycemia and Abnormally High Blood-Pressure with and Without Kidney Disease. (Iperglicemia ed ipertensione.) A. Farini.

114. **Prostatectomy.**—Prostatectomy is a comparatively rare operation in Italy, and Cimino lauds its advantages, particularly when it is done by Freyer's technic and the cavity left is tamponed with strips of gauze drawn with a thread through a Freyer-Marion tube. He operates with the bladder empty.

116. **The Sugar in the Blood with Kidney Disease.**—Farini tabulates the findings in twenty patients with high blood-pressure. Ten had kidney disease and ten had pronounced arteriosclerosis. Some of the nephritic patients had an abnormally large proportion of sugar in the blood but others did not, and none of the arteriosclerotics had more than the normal proportion.

Policlinico, Rome

August 3, XX, No. 31, pp. 1102-1140

117 *Painful Epigastric Hernia as Sign of Gastric Ulcer or Cancer. P. Alessandrini.

July, Medical Section No. 7, pp. 289-336

118 *Rhizomelic Spondylosis. M. Magnini.
119 Pneumococcus Hemorrhagic Ulcerative Enteritis. (Contributo allo studio delle enterorragie pneumoniche.) D. De Sandro.
120 Tests for Pancreas Functioning. (Osservazioni cliniche sulla ricerca del succo pancreatico nell'intestino.) G. Piantoni.

117. **Palpation of the Epigastrium in Diagnosis of Stomach Disease.**—Alessandrini remarks that in the present enthusiasm for laboratory and biologic tests, we must not overlook the importance of palpation of the stomach. This alone may reveal trouble below, and careful palpation of the epigastrium should never be neglected in case of pain connected with digestion. In a case reported, a man of 59 for eighteen months had had oppression and pain in the epigastrium three or four hours after meals, relieved by an alkali. There was no free acid, no vomiting, eructation or black stools, but palpation revealed a very small tumor in the epigastrium on the median line. The tumor became extremely painful to touch during the attacks of pain in the stomach, and during exercise. Roth has reported the case of a patient with a similar syndrome who for seven years had wandered from doctor to doctor taking courses of treatment for gastric ulcer or gastric neurosis, until finally the discovery of a minute hernia on the median line in the epigastrium cleared up the diagnosis and its removal put an end to all disturbances. In Alessandrini's case the hernia was accompanied by a gastric ulcer and the two were removed together. He thinks they were of independent development but that the hernia became painful only after the ulceration had occurred, while possibly the course of the ulcer may have been aggravated by the coexisting hernia.

118. **Ankylosis of the Spine.**—Magnini reviews the cases on record of rhizomelic spondylosis and reports a typical case from his own experience. The patient was a man of 34 and the first symptoms of his trouble had been noticed at the age of 12. After five years of gradually increasing stiffness of parts of the spine, a period followed with pain at these points and also in other joints in which the osseous surfaces are united by elastic fibrocartilages or they have a capsule with synovial lining. Thus the vertebral bodies, shoulder, knee, sternoclavicular and temporomandibular articulations were the ones involved. Study of his case and those on record has revealed certain common features which suggest that the trouble is the result of abnormal function of the glands with an internal secretion, and hence that organotherapy has some prospects of success if given in time before irreparable lesions are installed. He thinks that thymus extract seems most promising. Surgical and orthopedic measures have never given more than temporary relief, confirming the assumption of a constitutional cause.

Riforma Medica, Naples

July 26, XXIX, No. 30, pp. 815-840

121 Transient Glycosuria in Acute Tonsillitis; Four Cases. C. Farmachidis.

Medizinskoe Obozrienie, Moscow

LXXIX, No. 6, pp. 471-558. Last indexed June 21, p. 198

122 Serotherapy of Tuberculosis. M. A. Brustein.
123 *Suture of Stab Wounds of the Heart. A. N. Drosdoff.
124 *The Wassermann Test in Cadavers. A. Abrikosoff.
125 Rupture of Aneurysm of Abdominal Aorta into the Stomach Through an Ulcer. S. M. Zipkin.
126 *Municipal Sanatoriums Versus Specific Treatment in the Control of Tuberculosis. Fuchs-Volfring.

No. 7, pp. 559-646

127 *Urobilinogenuria and Its Significance in Infectious Diseases. S. Kamsarakan.
128 Tests of Kidney Functioning. A. Savelieff.
129 *Polyneuritis after Salvarsan and Neosalvarsan. N. Solomin.
130 *Serodiagnosis of Echinococcus Disease. A. *Abrikosoff.*
131 Cancer of the Cecum. (K Kazuistike heterologitcheskikh kankroidov slepoi kishki.) Tezengauzen.

123. **Suture of Stab Wounds of the Heart.**—Since the suturing of wounds of the heart has become a common procedure, the mortality from such wounds has fallen from 85 per cent. in 1867 to 57 or 53 per cent. in the last few years. Drosdoff has collected 222 cases of cardiac wounds that have been treated by suturing, and 105 of the patients recovered. As the symptoms of stab wounds of the heart are not always clear, the subjective symptoms (general condition of the patient, dizziness, pain in the chest, cerebral manifestations), and the objective signs (hemorrhage, presence of a wound in the chest in the cardiac region, increased cardiac dulness caused by effusion of blood, and abnormal murmurs) being very inconstant, Drosdoff prefers to operate even when there

is a mere suspicion of injury of the heart, though a presumptive diagnosis can generally be made from a combination of different symptoms. In a large St. Petersburg hospital the diagnosis was made in eleven out of twenty-one cases. The operation consists in enlargement of the wound in the chest, resection of the corresponding ribs and, while the heart is fixed by the finger—which may also help to check the hemorrhage—a silk thread is passed through the epicardium and heart muscle, without waiting for diastole or systole. The suture thread must not be tied too tight. The pericardial wound he advises to leave open and tampon; this helps also in draining. If the wound in the pericardium is too large, a couple of stitches are advisable in addition to the tampon. The beneficial results are sometimes striking, no complications in the form of irregular heart action, or pericardial adhesions occurring, as Drosdoff's case shows.

124. **The Wassermann Test in Cadavers.**—Abrikosoff studied the Wassermann test on cadavers and reports the results of 104 tests. Of these 104 cases ninety-two belonged to different non-syphilitic diseases, such as tumors, diphtheria, kidney and liver troubles, etc., and in all these cases the reaction was negative. In the other twelve cases, two belonged to scarlet fever which gave a positive Wassermann reaction with a nonspecific antigen (heart of a guinea-pig); the balance of ten showed syphilis either in the history, or in the pathologic changes of the tissues. The tested fluid was either the blood from the right heart and vena cava, or from the pericardium. The amount was 0.2 c.c. As antigen, an alcoholic extract of a syphilitic liver was used, or Landsteiner's antigen (heart of guinea-pig). Abrikosoff comes to the conclusion that the Wassermann test may be of great help to the pathologist in those cases in which a correct pathological diagnosis cannot be made, for instance, in cases of suspicious arteriosclerosis, aortic changes, chronic renal or liver lesions, etc.

126. **Municipal Measures for the Campaign Against Tuberculosis.**—Fuchs-Volfring discusses in this second article the advantages of specific treatment of tuberculosis as compared with the usual sanatorium treatment which, in his opinion, has given in Germany but meager results. (His first article on the subject was abstracted in The Journal, June 21, 1913, p. 1988.) The public sanatoriums as run at present in Germany, that is, admitting only the early, mild, curable cases, he regards as an anachronism and absurdity, but nobody there is bold enough to express such a view after the hundreds of thousands that have been spent on the sanatoriums. All the patients could have been given specific treatment in dispensaries without stopping their occupation, and a far larger proportion of patients and the 7,000,000 marks could have been thus saved, or the places in the sanatoriums filled by the patients with early tuberculosis could have been taken by 36,000 spreaders of infection. He is convinced that with specific treatment in dispensaries 60 per cent. of those given treatment in the German sanatoriums could have been cured, instead of the mere 20 per cent. of cures that were realized.

127. **Significance of Urobilin in the Urine.**—Kamsarakan has been studying Ehrlich's benzaldehyd reaction indicating the presence of urobilin or urobilinogen in the urine. To 8 or 10 c.c. of urine are added five or seven drops of 2 per cent. solution of paradimethylaminobenzaldehyd. A cherry color indicates a strong positive reaction; a pink color turning red on heating indicates a mild reaction. Altogether 518 patients were examined, with results as follows: In 155 cases of scarlet fever, the reaction was positive in all; in eighty-four cases of diphtheria a positive result was obtained in fifty-one, and in all these cases there was a mixed streptococcus infection; in the rest (thirty-three cases), in which pure cultures of diphtheria bacilli were obtained, or mixed with staphylococci, the result was negative; of 101 cases of various forms of angina, seventy gave a positive reaction, and in these seventy cases streptococci were found. In the rest of the cases, in all of which staphylococci were found, the reaction was constantly negative. In 183 cases of erysipelas—a strictly streptococcus affection—the patients all gave a positive reaction, while in pneumonia (initial stage), typhoid fever, chicken-pox, mumps and measles the test proved negative or inconstant as also in tuberculosis.

As a rule the reaction seems to be positive in all streptococcus infections and it indicates functional insufficiency of the liver. Derangement of the liver is the cause of the urobilinuria or urobilinogenuria—which is practically the same—as the diseased liver cannot transform the urobilinogen formed in the intestines from the bilirubin and biliverdin of the bile. Therefore the urobilinogen passes into the blood and reaches the kidneys which eliminate this substance with the urine. In all diseases in which the liver is directly involved, as in streptococcus infections, pernicious anemia, etc., the reaction is positive, but shortly before death it becomes negative. Therefore Kamsarakan considers the Ehrlich test important not only for the diagnosis, but also for the prognosis. (For other communications on this test see The Journal, May 31, 1913, p. 1750; May 18, 1912, p. 1538, or July 22, 1911, p. 346.)

Simon regards the test as very important for differentiating organic abdominal disease from merely nervous disturbances. In a recent case a young man for years had had trouble indicating hyperacidity, and there was always a strong positive response to the test for urobilinogen. The symptoms became so severe that the patient clamored for an operation and an old duodenal ulcer was found. In two other cases of hyperacidity causing trouble the intense reaction to the test for urobilinogen proved to be a manifestation or consequence of gall-stone trouble. He adds that the simple and easy technic for the test can be applied so readily, even at the office, that he commends it for general adoption in case of doubt whether the gastric symptoms observed are of purely nervous origin or are the work of some organic affection. (Simon's article appeared in the *Med. Klinik*, 1913, ix, 1164.)

129. **Polyneuritis After Salvarsan.**—Solomin's patient received one injection of neosalvarsan and two injections of salvarsan in the usual doses, but all within three days. About four weeks later polyneuritis developed, first in the lower limbs, and then in the arms. The course was progressively subacute; finally slow improvement set in under the usual measures, massage, electricity, baths, etc. The clinical picture, typical for arsenical polyneuritis, the slow recovery without any specific treatment, such as mercury or salvarsan, indicate the etiology of the trouble in Solomin's case in the drugs administered. The patient had been treated long before she came under Solomin's care with plain injections of arsenic which, however, did not cause any bad effects, as compared with those from the salvarsan.

130. **Serodiagnosis of Echinococcus Disease.**—The serum of patients with echinococcus deviates the complement, which Abrikosoff could prove on five patients through subsequent operations. As an antigen the fluid from the echinococcus cyst was used, this being the only variation of Wassermann's test. The echinococcus fluid may be obtained from sheep, beef or men, the best being the sheep's fluid, but that of beef being the most available. The fluid is kept on ice in small sealed tubes, and keeps perfectly for three months. The dose of the fluid is 0.5—1 to 5 c.c. of the mixture. The dose of the patient's serum is 0.2 to 0.6 c.c., the average and sufficient amount being 0.4 c.c. Altogether the blood of thirty-one patients was tested, and all but five proved negative, and in these five the operation showed the presence of the echinococcus. Therefore, deviation of complement with specific echinococcus antigen speaks for echinococcus, and *vice versa*. Sometimes a negative reaction before the operation turns positive after the operation.

Brazil-Medico, Rio de Janeiro

July 15, XXVII, No. 27, pp. 271-282

132 Research on Trypanosomes. (Nota sobre as schizogonias e gametogoñias dos trypanosomos.) H. de B. Aragão.

Hospitalstidende, Copenhagen

July 30, LVI, No. 31, pp. 845-932

133 *Transplantation of Femur. (Et Tilfælde af fri Transplantation af Knogle fra et Menneske til et andet—Homoplastik—til Erstatning for den nederste Halvedl af Laarbenet.) T. Rovsing.

134 *Ileus with Congenital Malposition of the Large Intestine. (Tilfælde af Ileus ved medfødt Retroposition af Tyktarmen.) T. Rovsing.
135 *Petrolatum Injections in Treatment of Arthritis and in Prevention of Ankylosis. (Om Vaselininjektion i Leddene, dens Indikationer, Teknik og Resultater.) T. Rovsing.
136 *Leukoplakia in the Bladder. (Leukoplakia vesicæ.) A. Lendorf.
137 Tumor from Aberrant Dental Tissue: Three Cases. (Adamantinomer.) J. Ipsen.
138 *Treatment of Burns. (Om Forbrændinger behandelte efter Rovsings Metode.) O. Wulff.

133. **Transplantation of Femur.**—In 1909 Rovsing implanted a stretch of the patient's own fibula in the place of a stretch of the humerus in a man of 26. The bone healed perfectly in place and complete function was restored, but after about a year, in lifting a comparatively slight weight, the fibula fractured, showing that this bone is not strong enough to stand much strain. In a more recent case a woman of 25 required resection of the lower part of the femur; in both cases the bone had been the seat of a sarcoma. In this latest case he implanted at once a segment of an old humerus to keep the stumps apart until the danger of local recurrence had passed. Two months later he had to amputate the leg of a girl of 14 with myelitis and spastic paralysis of the legs. The thigh was amputated between the upper and middle thirds, and Rovsing left the rest of the operation to others while he, on another table, dissected out the femur, wrapped it in napkins dipped in warm salt solution, wrapping it further in oiled silk and then placing it in a metal box and speeding with it in an auto to the other clinic where the patient was already prepared for the implantation, so that he could begin it at once, only twenty minutes after the beginning of the amputation operation. The old humerus implant was removed; the periosteum on the lower end of the femur was loosened and about 2 cm. sawed off, which was also done for 1 cm. on the tibia. Both bones looked healthy. The limb was then stretched and the implant cut to fit the gap of 14 cm., each end being cut with a point to fit into the stumps. It was further fastened with four aluminum-bronze sutures. The patella was removed. A year has passed since the first operation and there has been no recurrence of the sarcoma. There is still a minute fistula where the drain tube had lain, but otherwise the results have been extremely satisfactory. The patient still wears a leather bandage and walks with two canes, but has long resumed her office work. Roentgenoscopy shows the implant solidly fastened in place with good callus at both ends.

134. **Ileus with Congenital Malposition of the Large Intestine.**—Rovsing reports two cases; in the first the woman had had no trouble from this retroposition of the colon until ileus suddenly developed at the age of 20. The operation showed the colon lay behind instead of in front of the small intestine, passing through an opening in its mesentery. In another case the anomaly caused no disturbance until the first pregnancy.

135. **Treatment of Arthritis with Petrolatum Injections.**—Nine years ago Rovsing called attention to the fine results he had obtained in two cases of traumatic arthritis in the hip joint in which he had injected yellow vaselin, curing at one stroke the chronic disturbances. He here states that the cure has been permanent during the eleven and nine years since to date, and describes his further experience with forty-four other patients, eight requiring injections on both sides. This experience, he declares, has confirmed the efficacy of the measure, realizing his highest anticipations. The aim is to supply a lubricant when the natural lubricant, the synovia, is missing on account of the degeneration or cicatrization of the synovial membrane. The method is therefore applicable only in simple dry synovitis or senile joint affections in which the synovial membrane has lost its secreting power. Another indication for the method—and he reports eight cases to illustrate its advantages—is when the vaselin is injected to prevent development of ankylosis after incision or resection of the joint. This group of cases shows that injection of vaselin can successfully prevent ankylosis after resection of a tuberculous joint process, when all the diseased tissue can be removed. Also when there is no infection and hence no need of drainage. When puncture shows that there is fluid present in the joint, of course injection of vaselin is superfluous and may do great harm, but in appropriate cases his success has been remarkable. One young man of 22, a sailor, had had trouble in his right hip joint since the age of 9 when this region had been injured in a wagon accident. The joint had long been painful and the neighboring muscles were atrophied. The capsule was punctured with a trocar through an incision 5 cm. long above the greater trochanter. No synovial fluid could be detected, and at once 25 c.c. of yellow vaselin was injected. The relief was immediate, complete and permanent so that six days later the man passed a severe examination for the position of able-bodied marine and did his work without disturbance of any kind, no one suspecting the previous joint trouble until the navy surgeon several months later accidentally discovered the little scar left from the operation. (Rovsing's previous communication on the subject, giving the details of the first two cases mentioned above, was summarized in The Journal, April 29, 1905, p. 1412.)

He uses a tube with metal cap which screws on the collapsible tube of vaselin, and boils the whole for fifteen minutes before the injection. The only dangers are embolism and infection. The former is prevented by using a blunt-pointed cannula and being sure that no blood escapes from it and that the point moves freely in the joint before the cannula is screwed to the 10 cm. long rubber tube connected with the vaselin. The amount of vaselin to be injected seems to be about 20 or 25 c.c. for the hip joint; not over 10, 12 or 15 c.c. for the knee; 15 c.c. for the shoulder.

136. **Leukoplakia in the Bladder.**—Lendorf's patient was a man of 66 who had signs of chronic cystitis and for ten years had occasionally passed in his urine cells of epidermis in horny degeneration. The cystoscope showed a patch of leukoplakia in the bladder. He was treated as for ordinary cystitis and refused operative measures. Lendorf knows of only thirty-one cases of leukoplakia vesicae in the literature. The symptoms are those of chronic pyuria with cystitis, probably a vicious circle.

138. **Treatment of Burns.**—Wulff reviews the experiences with sixty cases of severe burns treated by Rovsing's method. The main features of the method are that the region around is sterilized and then, under a few whiffs of ether, the burned area is cleansed with soap, alcohol and a mild antiseptic. The burned area is then covered with rubber tissue in which numerous small holes have been cut. The rubber tissue extends about a quarter of an inch beyond the edges of the burn, and above the rubber tissue is spread a layer of 1 per cent. silver nitrate gauze, dry, and above this again dry absorbent cotton, the whole held in place with a gauze bandage. This local treatment is supplemented with narcotics, stimulants and saline infusion as indicated. Under this treatment no contracture developed in any case. The secretions escape around the edges or through the holes and are absorbed by the medicated gauze and the area heals over in an almost ideal manner. In one case a young man had been extensively scalded with steam; this treatment was applied almost immediately and the burn had entirely healed by the seventeenth day. In another very similar case three days elapsed before this treatment was begun, and the burn was already suppurating profusely. Sixty-seven days were required in this case before healing was complete. In six fatal cases in which the urine had been examined, albuminuria was noted in all but one, while there was albuminuria in only two of the forty-nine patients who recovered (among those whose urine had been examined), and the albuminuria was very slight. Wulff thinks that examination of the urine is important for the prognosis of burns. As only the severest burns were admitted to the hospital, the eleven fatalities in the sixty cases he regards as a good record. No report is made on the numerous other cases of burns in out-patients.

Ugeskrift for Læger, Copenhagen

July 31, LXXV, No. 31, pp. 1291-1320

139 Dwarf Growth and Myxedema. (Dværgvækst og Myxodedem.) C. E. Bloch.

The Journal of the
American Medical Association

Published Under the Auspices of the Board of Trustees

Vol. LXI, No. 11 Chicago, Illinois September 13, 1913

CHRONIC FOCAL INFECTION AS A CAUSATIVE FACTOR IN CHRONIC ARTHRITIS *

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I presented a paper[1] on this subject in January, 1912. The study of the subject has been vigorously carried on since that date. Altogether seventy patients suffering from arthritis deformans have been investigated and treated in the Presbyterian Hospital under the auspices of the Otho S. A. Sprague Institute and the Dane Billings Memorial Fellowship in the Department of Medicine of Rush Medical College.

This clinical research has confirmed the principles announced in the first paper. It has been found that the focal disease was usually located in the head. Most frequently this was a chronic streptococcus focus of the faucial tonsils; but chronic alveolar abscess and chronic sinusitis due to streptococcus infection were an occasional cause. In monarticular osteo-arthritis of the hip especially, chronic hypertrophic prostatitis with residual urine, chronic cystitis and infection with the colon bacillus seemed to be an etiologic factor. There can be no question that chronic gonorrheal infection of the seminal vesicles may cause systemic disease, especially arthritis. Streptococcus infection of the seminal vesicles may also cause systemic infection and especially arthritis deformans.

In this work the chronic focus of infection has been located in the faucial tonsils, dental alveoli or jaw, the antra of the head and in the seminal vesicles and prostate gland.

Rationally one may find the septic focus in any circumscribed streptococcus abscess, possibly a chronic appendicitis, chronic cholecystitis, etc.

The patients who were the subjects of this investigation were from the various walks of life. All were adults. Three patients over 50 years of age suffered from monarticular osteo-arthritis of the hip (morbus coxae senilis). All of the remainder presented the three prevailing types of chronic arthritis with deformities; that is, the so-called proliferative or hypertrophic; the degenerative or atrophic; and the spondylitis deformans type.

The study of these patients shows that an individual who suffers from what may be called a true arthritis deformans presents not only an arthritis (periarthritis, synovitis or osteo-arthritis may be present in different joints of the same patient), but also a chronic myositis which is more or less selective. The muscles most often involved are the biceps humeri, the masseters, the erector spinae, the anterior tibial group and the hamstring muscles. This is a chronic not very painful myositis which causes shortening of the muscular fibers. Hence the inability of most of these patients to extend the forearm fully. Many cannot fully open the mouth because of the contracted masseter muscles. Some rigid spines are due to muscular contraction and rigidity and not to involvement of the joints of the vertebrae.

Most of these patients present evidence of chronic neuritis or perineuritis of single or multiple nerves, at some time in the course of the disease.

Practically all of these patients suffer from general debility; anemia of various degrees, loss of weight, lessened strength and endurance, and functional nervous disorders. Long suffering intensifies the perception of pain and other discomforts.

There can also be no question that a faulty metabolism modifies the whole morbid process. If one considers the results of the treatment carried out in this investigation, it would seem that the faulty metabolism is not a primary factor etiologically. Nevertheless, it is an important factor in the progress of the disease and also in its treatment.

The severe trophic disturbances which occur in the joints (cartilage, bone, etc.), the appendages of the skin (nails, hair, sweat-glands), are difficult to explain. One does not find cerebrospinal or peripheral nerve lesions to account for these changes as in tabes dorsalis (Charcot joint) or other neuropathic conditions. Probably the primary cause is the tissue reaction to the bacterial toxin, and this specifically excites a proliferative or degenerative local metabolism with the characteristic morbid anatomy. In the experimental inoculation of rabbits with a strain of streptococcus obtained from arthritis patients by Dr. D. J. Davis[2] and Dr. Leila Jackson,[3] non-suppurative, proliferative and degenerative joint lesions were produced. From the joint tissues the same organism was recovered. There is, therefore, a strain of the streptococcus which will specifically produce in the inoculated rabbit morbid anatomic lesions, which resemble the morbid joint changes in arthritis deformans in man.

The method of procedure in this investigation was the same as that described in the former paper. From each patient a most thorough clinical history was obtained. A careful general and special examination was made. When necessary clinical aid was obtained from throat specialists, urologists and other special

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* Read in the Section on Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

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[1] Billings, Frank: Chronic Focal Infections and Their Etiologic Relations to Arthritis and Nephritis, Arch. Int. Med., April, 1912, p. 484.

[2] Davis, David J.: Bacteriologic and Experimental Observations on Focal Infections, Arch. Int. Med., April, 1912, p. 505.

[3] Jackson, Leila: Experimental Streptococcal Arthritis in Rabbits, Jour. Infect. Dis., 1913, xii, 364.

experts. When found the focal infection was removed surgically or otherwise. Plate-cultures of the material were made from the abscesses or exudate of the operated tissues. Subcultures were made from the dominant bacterial colonies of the plates. The opsonic and phagocytic indexes of the blood of the patient with the dominant bacteria were studied before and after autogenous vaccination at intervals of one week. Rabbits were inoculated with the living bacteria, and the results studied on the animal living and dead.

These bacterial studies have revealed some notable results. The dominant organism found in abscesses and sealed crypts of the faucial tonsil are *Streptococcus viridans* and *Streptococcus hemolyticus* (*pyogenes*). The *S. viridans* is usually a surface growth, while the *S. hemolyticus* is frequently found in pure culture in the deeper infected tissues. In acute rheumatism the bacteria obtained from joint exudate and from rheumatic nodes have been studied by Dr. Edward C. Rosenow, fellow of the Memorial Institute for Infectious Diseases, cooperating with us. He has found that organisms from rheumatism appear to occupy a position between *S. viridans* and *S. hemolyticus*. They are more virulent than the former and less virulent than the latter. Three types of organisms have been isolated from rheumatism. One type produces green on blood-agar and forms very long chains. The second type produces a narrow zone of hemolysis on blood-agar from the beginning or after several generations and forms short chains. The third type produces a grayish-brown colony without affecting perceptibly the blood in the media and appears as a diplococcus in short chains and as single cocci. By varying the condition of growth, these types may be changed quite readily, one into the other. The most distinctive cultural features are their production of a very high acid reaction in dextrose broth and abundant growth at a low temperature. They are more virulent to warm-blooded animals than *S. viridans*, but less virulent than *S. hemolyticus* and, of course, the pneumococcus. To frogs at 22 C. (71.6 F.) the virulence of the rheumatism strains is, however, greater than both the *S. hemolyticus* and the pneumococcus; but if the frogs are kept at 37 C. (98.6 F.) the order of virulence is the same as in warm-blooded animals.

The cultural features are not so distinctive as the pathogenic properties. The results following injection in animals are quite different from those following injection of *S. viridans*, *S. hemolyticus* and even mixtures of these two strains. It is common to produce by intravenous injection in rabbits, multiple non-suppurative arthritis, endocarditis, myocarditis and pericarditis in the same animal. By modifying these strains by varying culture methods, their affinity for joints, endocardium and pericardium becomes less and the affinity for the muscles, myocardium and kidney much greater, producing now a non-suppurative myositis. The largest number of these lesions is found in the flat muscles of the neck, shoulders and spine, the intercostal muscles and the more tendinous portions of the muscles of the extremities. Three of the strains from rheumatism have been converted into typical pneumococci. Reverse transmutations may be made from the pneumococcus to the various cultural characteristics (green, gray and hemolysis producing streptococci) by varying the culture mediums, oxygen tension, etc. The strains of streptococci studied from various patients are undoubtedly the same as those described by Poynton and Payne and Beattie as the *Micrococcus rheumaticus*. The results of the clinical studies and animal experimentation by Poynton, Payne, Walker, Beattie, Yates, Cole and others have been of great value in establishing the cause of acute articular rheumatism. Confusion has existed in the minds of many because the organisms described by the different investigators did not coincide.

The results of the work of Rosenow seem to adjust the differences, for his experiments show that the same organisms may be changed by cultural methods so that they may in mediums show progressive phases of transmutation. The range of transmutation is from a type of streptococcus to the pneumococcus. Furthermore, at different stages of the transmutation he has, at will, produced in the inoculated rabbit, suppurative arthritis, or at another phase multiple proliferating arthritis, endocarditis, pericarditis and myocarditis, or at another phase myositis of some of the general skeletal muscles, at another phase, a virulent type which produces arthritis with proliferative and degenerative joint lesions, and at another phase typical pneumonia. These experiments probably clear up this difference in results and the varying types of streptococci described by many investigators.

Many investigators have searched for the source of the infectious organisms of chronic arthritis in the alimentary tract. Strains of streptococci isolated from the feces have been used as vaccines in the treatment of chronic arthritis. We have not experimented with the intestinal flora in this investigation.

In the treatment of these patients we have carried out the following plan:

1. All possible sources of focal infection have been removed. Tonsillectomy; oral surgery for alveolar abscesses (roentgenography will show jaw disease); drainage or other measures to cure sinusitis; vasectomy to drain and to use the vas deferens to wash out infected seminal vesicles and to drain the prostate gland, and any other measures necessary to surely remove all possible streptococcus foci of infection have been made use of.

2. The patient's immunity to the infectious organism has been improved by:

(*a*) Absolute rest for an indefinite period. This may be absolute or partial recumbency dependent on the individual and the character of the disease.

(*b*) Improvement of the general and individual hygiene. The patient needs good air, sunshine, good wholesome food with plenty of proteins to replace wasted tissue, restorative tonics when required, plenty of fluid drink and the necessary laxatives. Fatigue must be avoided. Gentle superficial massage may be used, but in the beginning never to the degree of causing pain and fatigue. A cheerful environment and constant moral support are essential to all of these patients who are despondent because of long suffering. Many of them are pessimistic of hopeful results of treatment because baths, superheated-air treatments, massage, osteopathy and drugs have not only failed, but have made the disease worse. These measures modified to meet individual peculiarities will usually improve the general condition, and the immunity to the infectious organism is increased as shown by the steady improvement in the condition of the joints. Indeed, it is my opinion that these measures alone will stop the further progress of the disease, and usually entire recovery will take place; but for some patients this will require a long period of treatment.

(*c*) Autogenous vaccinations with the strains of streptococci isolated in each patient. This practice has been followed in practically all of the patients. Immunologic study of the blood has been made coincidently. As a rule the opsonic index and also the phagocytic index have been increased by these vaccines.

Many of the patients investigated had been ill for months or years. Some of them had received vaccinations of commercial vaccines, single and mixed, and during the past year several had received repeated injections of Rheumo-Phylacogen. As far as could be learned, these treatments were instituted without any investigation of the patient's condition, and without a diagnosis of the infectious micro-organism. Not one of them had received benefit from the vaccines of any kind. Many of them were apparently made worse.

There is a value in vaccine therapy, but to obtain benefit from vaccines, they should be rationally used. To use vaccines, simple or mixed, in the treatment of a patient, without first ascertaining the nature of the disease, and if infectious, the kind of invading organism, is unscientific, reprehensible and wrong. When the mixed vaccines or the filtrate of culture-broth of countless organisms are used, it is like the shotgun prescription of our ancestors of the profession. They were and are intended to hit something. There is this difference between the old and the new shotgun: The abused stomach could reject the old shotgun mixture; the new shotgun mixture is injected subcutaneously or intravenously, and the patient cannot escape it. It is my opinion that vaccine therapy irrationally used and the injection of so-called serums made from culture-broths are usually without benefit to the patient with arthritis deformans and often result harmfully to the health or life of the invalid.

THE USE OF POLYVALENT STREPTOCOCCUS HORSE-SERUM IN CHRONIC ARTHRITIS

In the latter part of 1911 and the early part of 1912, two horses were immunized with approximately thirty strains of streptococci obtained from the foci of infection of the patients suffering from arthritis deformans. This serum was concentrated and refined and after heating was used in approximately twenty-five patients. The serum seemed to intensify the immunizing effects of the autogenous vaccines. In spite of the practice of all known precautions, every patient suffered after the second or third treatment from anaphylaxis. Usually this was manifested as an erythema and urticaria, with intense itching of the skin. There was usually a slight rise of temperature and much discomfort from muscular soreness, aching and joint pain. Three patients, all women, suffered from anaphylactic shock of such severity that they nearly died. Inasmuch as we could not prevent these reactions, by all known precautions, that part of the treatment was abandoned as a measure too dangerous to use. This we did with the conviction that the other measures enumerated before, to improve the immunity of the patient, were practical and sufficient.

When the improvement of the joints and the general condition of the patient permitted, the contracted muscles were stretched under gas anesthesia, and if necessary plaster casts were applied to the lower extremities. At the proper time calisthenics and graduated walking were instituted. Tonic hot-cold spray baths were given daily to some patients.

Hospital treatment is necessary to properly investigate and manage patients with chronic arthritis. Otherwise the necessary discipline, individual hygiene, proper rest and the later application of passive and graduated exercise will not be faithfully carried out.

DIFFERENTIATION OF ARTHRITIS DEFORMANS FROM OTHER TYPES OF CHRONIC ARTHRITIS

Based on these clinical and bacteriologic studies and experiments, I think we may now recognize arthritis deformans as a distinct clinical type. The proliferative and degenerative types of polyarthritis present a subacute or chronic course with exacerbations and remissions, polyarticular arthritis (periarthritis, synovitis, osteo-arthritis), chronic myositis with contractures of muscles and consequent deformities, palpably sore nerve trunks, trophic disturbances of the skin and its appendages, varying degrees of malnutrition and frequently a neurotic condition. Severe and mild degrees of the disease exist. In an early stage recovery may occur and in later stages with serious morbid structural changes the progress may be checked spontaneously. This is explicable when one recalls the fact that the etiologic chronic focus may disappear spontaneously by the development of a process of local immunity.

Chronic gonorrheal arthritis is often deforming and not uncommonly is polyarticular. The knee, ankle, wrist, shoulder and spine are the joints most frequently involved in the order named. Tenosynovitis is a common occurrence in gonorrhea, but myositis practically never. Male adults are more often infected than females. The frequency of gonorrhea in female children makes gonorrheal arthritis more common in girls than in boys. If a careful examination is made the focal gonorrhea can usually be found. In the male the seminal vesicles and prostate are the seat of the focus and in the female the vagina, fallopian tubes and probably the glands of the labia may harbor the organism. The skin anaphylactic test may be used to confirm the diagnosis. The removal of the cause; massage of prostate and vesicles, vasectomy to promote drainage of the vesicles and prostate and to permit the injection of antiseptic remedies into the vesicles through the vas deferens, and the necessary surgical and local treatment of the female genitalia will render the diagnosis absolute by the recovery of the patient.

Chronic tuberculous arthritis is usually monarticular, often suppurative, and begins as an osteomyelitis in the short bones or in the epiphysis of a long bone; there is frequently a tenosynovitis and practically never a chronic myositis. The clinical history is usually very characteristic. Often the bone or joint disease immediately follows trauma of some sort. After a period great improvement or apparent recovery occurs to be followed in a few weeks or months by a return of the joint disease, which then steadily progresses in severity.

Neuropathic joints (Charcot) are always associated with some of the characteristic signs of tabes dorsalis.

Chronic podagra, with the characteristic tophi and selection of the small joints as a rule is easily recognized. Gouty tophi may be present as a coincidence in arthritis deformans.

Senile arthritis with deformities due to Heberden's nodes, and atrophic changes may be difficult to differentiate from the degenerative (atrophic) type of arthritis deformans. The absence of chronic myositis, with contraction of the biceps humeri and masseter muscles and the age of the patient are helpful in differentiation. Senile changes may be coincident in arthritis deformans.

THE RESULT OF THIS METHOD OF TREATMENT

In those patients in whom no marked destruction of tissues has occurred, recovery has taken place in many and others are convalescent. Patients with cartilaginous and bone disease have vastly improved and the progress of the disease has been apparently checked. Case reports are not included for lack of space.

CONCLUSIONS

1. Arthritis deformans is an infectious clinical entity manifesting chronic periarthritis, synovitis, proliferative and degenerative osteo-arthritis, chronic myositis with contraction of muscles and perineuritis or neuritis.

2. Usually coincident but secondary malnutrition and faulty metabolism aggravate the condition of the patient.

3. The infectious source is usually focal and located in the mouth (alveoli), faucial tonsils or antra (sinuses). Occasionally the focus may be in the prostate gland, seminal vesicles, the female genitalia, and probably also in a streptococcus chronic appendicitis or cholecystitis or a circumscribed streptococcus infection anywhere. That the infection may occur from a chronic streptococcus invasion of the intestines is a question to be decided.

4. The morbid anatomy of the experimental chronic arthritis is the same as that found in man. This morbid anatomy is the specific reaction of the infectious organism.

5. Arthritis deformans may be differentiated from other types of chronic arthritis by the characteristic coincident involvement of periarticular and articular structures, chronic myositis, consequent contractions of muscles, secondary trophic changes due to a faulty metabolism, malnutrition, etc.

6. The treatment and management must comprise: 1. The removal of the cause. 2. Improvement of the immunity by rest, personal hygiene, including good food, pure air and sunshine, rational calisthenics and physical culture, moral support and a cheerful environment. Autogenous vaccination may be added to still further improve immunity.

7. The clinical results confirm the principles embodied in this paper.

This investigation has been conducted by a group of workers cooperating with me. Dr. Homer K. Nicoll, the Dane Billings Memorial Fellow in Medicine in Rush Medical College, has made the cultures of bacteria and supervised the immunologic vaccinations and serum inoculations. Dr. D. J. Davis, pathologist at St. Luke's Hospital, has supervised the immunologic studies at that institution. Drs. George E. Shambaugh and S. A. Friedberg have performed the necessary nose and throat examinations and operations. Drs. John Ridlon, A. D. Bevan, Dean Lewis, Carl Davis and C. J. Rowan have given aid when surgical measures (stretching muscles, breaking up adhesions, and applying casts and braces) were required in the treatment.

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THE RÔLE OF THE PROSTATE AND SEMINAL VESICLES IN GENERAL TOXEMIAS *

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It is now becoming more and more generally recognized that the etiology of many obscure joint, cardiac, neurologic and other diseases is to be found in chronic infections in remote organs, and in recent years the tonsil, nasopharynx, and alimentary tract have come to be regarded as the frequent site of such infections. The extent to which the genito-urinary tract is to blame has not been appreciated, and in reviewing the literature one finds very few valuable articles giving exact data on this question. Of course, it has long been recognized that gonorrhea, both acute and chronic, is responsible for many general infections, but the part played by the acute and chronic infections of the higher genito-urinary tract, the kidney and bladder, the epididymis and testicle, the prostate and seminal vesicles, has received scant accurate attention.

In this article I shall confine my attention to the rôle of the prostate and seminal vesicles in chronic toxemias and remote infections.

The frequency of acute prostatitis and seminal vesiculitis is well recognized. The fact that in the majority of cases of gonorrhea, the posterior urethra, prostate and vesicles become involved is well known, but I believe that the profession fails to realize, or perhaps neglects the fact that chronic prostatitis and seminal vesiculitis are extremely common diseases, and that they may exist without producing symptoms or attracting the attention of the patient for years, only to show themselves as a danger-seat when the patient marries or becomes the subject of chronic rheumatism or other forms of remote infection and toxemia arising from an old prostatitis or vesiculitis.

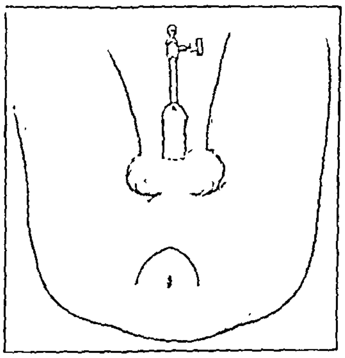

Fig. 1.—Showing the crescentic incision in the skin.

The original etiology of these cases is by no means always gonorrheal. Many arise from bacterial infections which come down through the urinary tract, having been eliminated through the kidneys during acute infections in other parts of the body. I have seen several such cases as a result of typhoid fever, and they are not uncommon in chronic inflammations of the kidney and bladder. Infections also reach the prostate from the rectum not infrequently as a result of proctitis, ulcer, hemorrhoids, etc., but more common still are those which come as a result of the long-continued frequent habit of masturbation, which in many cases produces an extensive chronic inflammatory process involving both the prostate and seminal vesicles and the tissues around them, so that one frequently finds an extensive enlargement and pronounced chronic inflammatory condition associated with local and remote symptoms sometimes of severe character.

The gross pathology of chronic prostatitis and vesiculitis varies so greatly that time precludes my doing more than mentioning the subject here.

On rectal examination often the prostate is very little enlarged, and may be quite smooth, but the surface is generally indurated, often variable in character, slight irregularities being present and adhesions to the rectum and lateral walls of the pelvis usually found. In the majority of cases the seminal vesicles are similarly affected, irregularity, induration and adhesions being the characteristic findings. In more pronounced cases there may be greater enlargement, sometimes very great, very marked induration, and sometimes softening, fluctuation, localized focal abscess, etc., though these are rare. The essential process is an endo-acinous and periacinous inflammation in the prostate and chronic inflammatory infiltration within and about the vasa deferentia and

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* Read in the Section on Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

seminal vesicles. Owing to the fact that all these structures drain badly, being dependent on minute tortuous ducts and tubules, foci of chronic inflammatory infiltration remain unrelieved for years, often become surrounded by fibrous changes, and remain centers for the absorption of toxins and infections, and sources of local irritation, pain and discomfort.

It is indeed remarkable that any of these patients ever recover. As a matter of fact, in many chronic inflammations in this region recovery never occurs unless vigorous assistance is given either by the mechanical evacuation afforded by prostatic and vesicular massage or hot rectal douches, or by bacterial therapy or by operation.

SYMPTOMS CLASSIFIED

The results symptomatically of chronic prostatitis and seminal vesiculitis may briefly be classed as local, urinary, sexual, nervous and general.

The local symptoms are often so slight (merely a little discomfort, fulness or heaviness in that region) that it is most often the sexual changes which bring the patient for treatment.

The nervous symptoms are often so remote and disconnected that the prostate is not suspected. I have seen many cases of lumbago, sciatica, vague pains in the back, hips, thighs, perineum, groin, and often as far as the soles of the feet, caused by chronic inflammations of the prostate and seminal vesicles which by involving nerve terminals cause stimuli to be sent to the spinal cord and there transmitted to other visceral and superficial regions according to the dicta laid down by Head in his explanation of the etiology of referred pains.

I hope I may be pardoned for digressing somewhat to call attention thus to the great importance of examining the prostate in many painful conditions anywhere between the diaphragm and toes, when there are no localizing symptoms to direct attention to the prostate itself. In such cases it is often the site of an extensive chronic inflammatory process which is the cause of the whole trouble. I know of ten cases in which there was operation for renal calculus, the symptoms of which were typical: severe intermittent colicky pain radiating to the groin and associated with symptoms of hematuria and entirely due to a chronic inflammatory process in the prostate and seminal vesicles with reflex referred pains to the kidney region, the blood coming from a congested and inflamed posterior urethra.

It is with the conditions and symptoms resulting from absorption of toxins and bacteria from the prostate and seminal vesicles which it is my particular object to lay stress on, and perhaps I cannot do better than to cite a few cases to bring out some of the different phases of these conditions.

REPORTS OF CASES

Case 1.—G. W. S., aged 31, complained of multiple arthritis of six years' duration following an old urethritis. There were no local prostatic symptoms. The patient was bedridden and reduced to a skeleton; he was unable to walk, use his hands or even his jaws. He voided urine normally, and there was no urethral discharge, but rectal examination showed that while the prostate itself was only slightly enlarged and indurated, there was an extensive plateau of infiltration above it. An operation through the perineum evacuated a great deal of pus with a resulting immediate benefit in joints which had so long been terribly inflamed.

Case 2.—R. L. G. complained of arthritis of left knee and painful heels. The patient had had gonorrhea several years before, and now very slight urethral discharge and no urinary symptoms. Examination showed double Achilles tendon bursitis and exostosis of the os calcis, besides extensive arthritis of the left knee. The prostate and seminal vesicles, which gave forth no symptoms, were enlarged, indurated and adherent, and the secretion obtained from them contained pus. Treatment by rectal massage and intravesical irrigations of nitrate of silver gave good results.

Case 3.—M. S. complained of sciatic rheumatism, pain in back, hips and thighs, and inability to walk without crutches. There were no urinary symptoms and no urethral discharge. The urine was clear and the kidneys negative. Roentgenoscopy revealed exostoses along the spine, and examination of the prostate and seminal vesicles disclosed a chronic inflammatory process, the secretion obtained by massage containing pus in abundance. Under local treatment the patient was soon able to dispense with his crutches and walk, and many of the referred pains had disappeared before plaster jackets were applied for the relief of the spinal exostoses.

Case 4.—J. B. C. complained of severe dull pain in the right iliac fossa of several years' duration. The patient had had gonorrhea twenty-four years previously and four years later he began to suffer pain which had never left him. The appendix had been removed, the kidneys suspended, various abdominal organs examined and the patient had had numerous operations without relief. Examination disclosed a chronic prostatitis and marked seminal vesiculitis on the right side; the nerve terminals being involved in the inflammation and giving rise to the referred pains from which the patient had suffered so long.

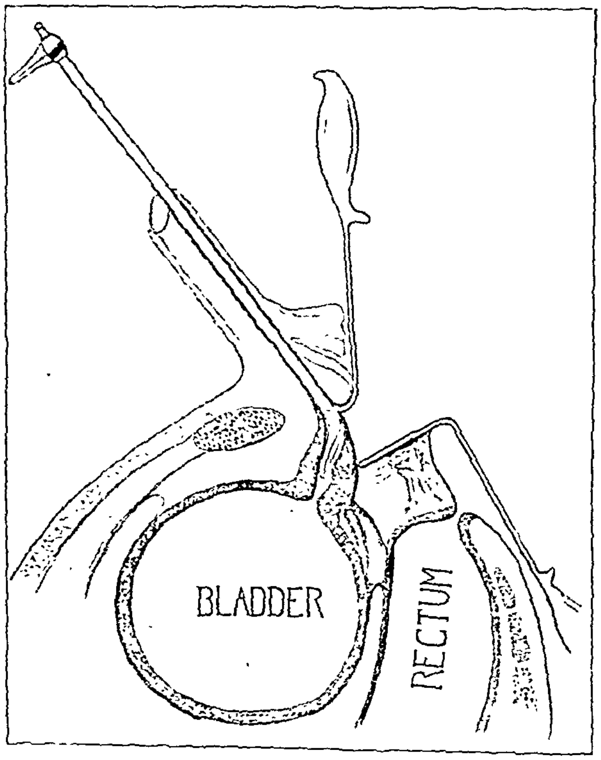

Fig. 2.—The tractor used as a sound in the posterior urethra to show the position of the membranous urethra and apex of the prostate.

Case 5.—G. H. R., aged 63, complained of severe pain in the back and legs of ten years' duration, which often incapacitated him from working. There was no history of gonorrhea. There were also frequency of urination and on coughing a severe pain across the lower abdomen. Examination showed a chronic prostatitis and vesiculitis with an extremely tender point in the middle of the prostatic urethra, and pressure on this was followed by the escape of a calculus from the urethral meatus.

Endoscopic examination showed a very large verumontanum, in the center of which was a cavity from which the calculus had escaped. The symptoms as described persisted regardless of the escape of the calculus until by treatment the prostate, seminal vesicles and verumontanum had been brought to normal. Since then, for several years, the patient has remained entirely well.

Case 6.—S. M. C., aged 58, complained of severe attacks of heart-disease, fever and frequency of urination. The patient was quite well until an attack of acute prostatitis, non-gonorrheal in character, several years previously. Since then evidence of myocarditis and severe organic change in the heart has come on, the condition being aggravated from time to time by temporary increase in the prostatic inflammation. Examination showed a very bad heart, myocarditis, auricular fibrillation characterized by severe attacks of dyspnea and very rapid heart-action. The prostate and seminal vesicles were chronically inflamed; infection by the colon bacillus and a chronic cystitis were present. Prostatectomy and seminal vesiculotomy were indicated but not carried out owing to the severity of the cardiac condition. Under local treatment the condition of the patient improved considerably for a time, but in a few months he died as a result of his heart-disease.

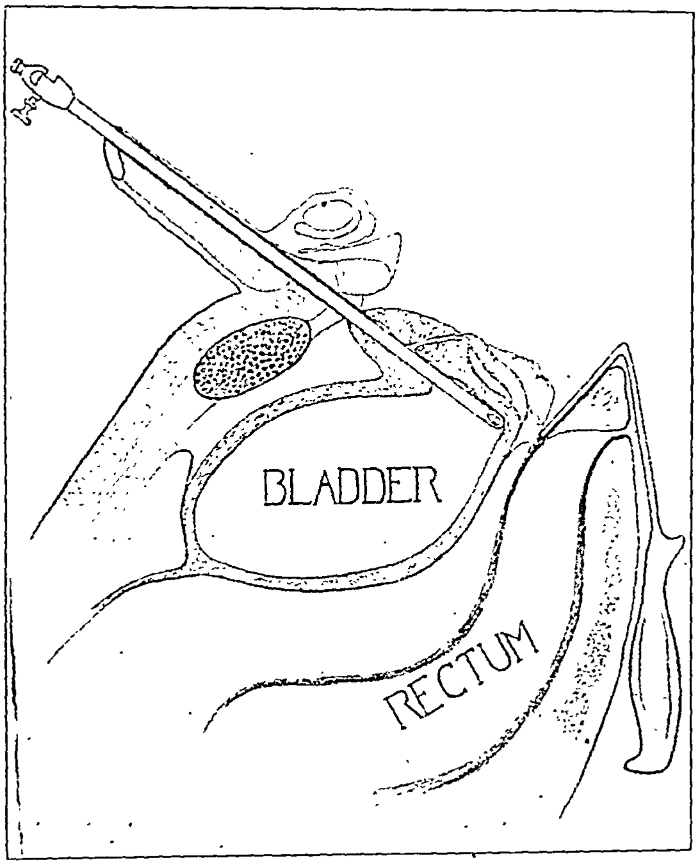

Fig. 3.—Tractor opened out, traction made and seminal vesicles exposed.

Patients with prostatic hypertrophy have in many instances an associated chronic prostatitis and seminal vesiculitis, and I have frequently seen severe joint troubles and neuritis, resulting from these conditions, absolutely relieved by perineal prostatectomy, often to the amazement of the patient at the unexpected cure of an old rheumatic condition from which he had suffered for years.

Glancing at the literature one finds numerous articles on gonorrheal arthritis and other forms of general gonococcus infection, all of which are too well recognized to need more than passing notice here.

Very little is to be found in the literature in regard to the remote infections and toxemias resulting from chronic diseases of the prostate and seminal vesicles.

In a recent report of 254 cases of seminal vesiculotomy performed on account of chronic inflammation of the seminal vesicles, Fuller states that 124 cases, or about 50 per cent., were associated with "absorption or toxic rheumatism," and that all of these cases were relieved in a most radical manner by the operation of vesiculotomy. In his last series of eighty-nine cases, "80 per cent. of the patients were well and free from all symptoms when passed from observation a month or six weeks after operation." One of his patients operated on three years before, after having been on crutches for seven years, is now in perfect physical condition.

Besides the article of Fuller one finds practically nothing in the literature as to the operative treatment of these cases, but numerous rather indefinite articles describing general methods of treatment, particularly by means of vaccines, serums, etc., with some enthusiastic and many unsatisfactory results.

The operation performed by Fuller is so well known that I need not refer to it here. This procedure, which requires such extensive incisions on each side of the buttocks, rectum and perineum and is seemingly so formidable, is shown by Fuller to be free from danger in that he has had no mortality in 254 cases.

An operation which I have been in the habit of carrying out is based on a desire to see the region of the prostate and seminal vesicles, and to be able to proceed thereon as indicated by the pathologic conditions found to be present.

The prostate is exposed in much the same manner as in perineal prostatectomy, the only difference being that instead of a sound in the urethra a long special prostatic tractor, which can be passed through the urethral meatus is employed. The usual inverted V-shaped cutaneous incision starting with the vertex of the V about 1¼ inches in front of the anus, and the two branches paralleling the ischiopubic ramus to a point about an inch to the outside of the anus on each side are used. After the fat and superficial fascia have been penetrated, the fossa on each side of the central perineal tendon bounded in front by the transversus perinei muscle, posteriorly by the levator ani muscle, and externally by the ischiopubic ramus is opened up by blunt dissection with the finger and scalpel. The bifid tractor is then introduced, thus pulling the levator ani backward and putting the central tendon on stretch. With a scalpel this tendon is divided immediately behind the bulb, and deep down the muscular fibers covering the membranous urethra and known as the recto-urethralis muscle are cut, thus allowing the rectum to be pushed back, and the urethra containing the closed long tractor exposed.

Up to this point the procedure has been practically that of perineal prostatectomy. Now instead of incising the membranous urethra, the long tractor is pushed down into the bladder, opened out, traction made, and the posterior surface of the prostate then exposed after separating the rectum from it, the operator being sure that he is in front of Denonvillier's posterior fascia, and working on the shiny capsule of the prostate itself, which is always the guide to show when one is in the proper layer of cleavage in separating the rectum from the prostate. By continued traction and use at the same time of the instrument as a lever by pushing the outer end toward the patient's hip, the prostate is compressed against the triangular ligament and the seminal vesicles are brought up toward the wound where, with good lateral and posterior retraction, any procedure which seems desirable can usually be carried out. Sometimes the adhesions around the seminal vesicles are so extensive that they have to be broken through before good exposure of these structures can be otained, but usually little difficulty is experienced in drawing the seminal vesicles close into the wound. Examination will then show that they are covered by the same transverse layer of fascia as the prostate, the anterior fascia of Denonvillier which forms the true strong capsule of the prostate and also covers transversely the seminal vesicles, vasa deferentia and intervesicular and retrovesical structures, and this must be divided before any of these structures can be attacked.

It is well here to make a careful survey of the site, to see whether the prostate is sufficiently abnormal in any portion to require incision or excision, and the same for one or both seminal vesicles. The vasa deferentia cannot be so easily detected, but after division of the fascia of Denonvillier they can usually be isolated, examined and opened if desired. Examination previous to operation should have shown with considerable accuracy the conditions present, and given an indication of the extent of the procedure which should be carried out; but the extent of the procedure will depend much on what the operator finds with the parts thoroughly exposed, when they can be palpated and explored. If the seminal vesicle is surrounded by considerable adhesions these should be freed as much as possible, and the vesicle either opened by one or more incisions or by removing a portion of its posterior surface. The fact that the seminal vesicle is a complicated structure running up and down in several loops before finally ending in the ejaculatory ducts shows the importance of a thorough drainage in several places if necessary, and I occasionally make several windows in the seminal vesicles thus uncovering the interior and supplying good drainage. Resection or incision to a great extent is usually unnecessary and undesirable, except in tuberculosis for which operation is usually contra-indicated, though easily carried out by this procedure.

The importance of "pus tubes in the male," as shown by Belfield, suggests that it may be found desirable in some cases to open widely the ampullae of the vasa deferentia which are easily discovered after the fascia which covers them and the vesicles is turned to one side by the two longitudinal or one transverse incision, and I am of the impression that much more satisfactory drainage for chronic collections of pus in the vasa deferentia can be obtained by this operation than through operations on the vasa in the groin or scrotum. The method of attack on the prostate itself depends, as remarked above, on the extent of the pathologic process, and should be by incision or excision, single or multiple, every effort being made, of course, to preserve the floor of the urethra and ejaculatory ducts and not to open into the urethra. If the median portion of the prostate is enlarged, indurated and obstructive it may be excised or enucleated from in front of the ejaculatory ducts from one of the lateral incisions in the prostate, but as a rule this is best attacked by the punch operation independently, unless a prostatectomy is desirable, when it will usually be best to employ the regular procedure rather than the method above described.

Fuller advises draining the seminal vesicles for ten days by means of rubber tubes, and his experience has been very extensive. It is certainly important not to remove the tubes or gauze packing too soon, else one is liable to have the external wound close with a recurrence of suppuration in the vesicles and prostate and recrudescence of the rheumatism, etc. The external wound is partly closed by bringing together first the levator ani muscles with single suture of chromicized catgut so as to restore them to their normal position in front of the rectum which they protect against pressure on the gauze or drainage tubes, and partial closure of the skin wound. I now generally bring the tubes and gauze out on one side and close the other completely with a continuous subcutaneous catgut suture.

The operation above described is not difficult, in fact much easier than prostatectomy. The long tractor capable of being passed through the urethra does away with the necessity of the incision of the membranous urethra to introduce the old prostatic tractor and thus avoids a urinary fistula, of even temporary character. The ability to see and palpate the prostate, seminal vesicles and vasa deferentia is, I believe, of prime importance in surgery here as elsewhere.

In conclusion, I may say that the prostate and seminal vesicles are very frequently the site of chronic inflammatory processes which often continue for years, give very few local symptoms and are the insidious cause of remote processes, as a result of absorption of toxins and bacteria, and chronic pains referred to other portions of the body, so that the symptoms produced are generally quite remote and apparently unassociated with the prostate and seminal vesicles. This fact should bring home to all practitioners of medicine the very great importance of rectal examinations as a routine procedure. Since such methods have been enforced at the Johns Hopkins Hospital in the medical department, many obscure and distant maladies have been cleared up and ultimately cured by treatment directed to the original source of disease, the prostate and seminal vesicles.

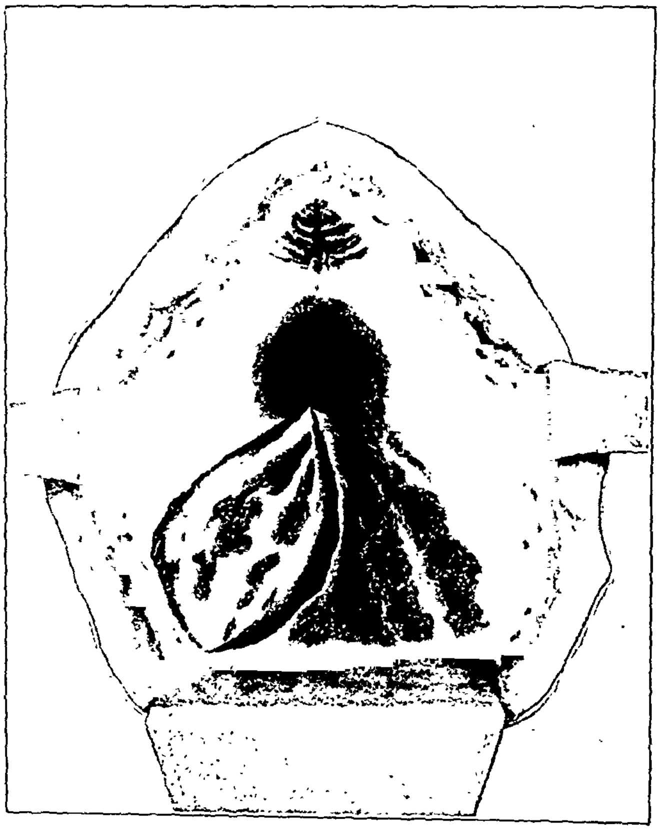

Fig. 4.—Exposure of seminal vesicles. Incision of the fascia of Dénonvillier preparatory to incision or excision of the vesicle.

Cold Spring Lane.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. BILLINGS AND YOUNG

DR. JOHN RIDLON, Chicago: Is anything to be done for the joint in these cases of chronic non-tuberculous joint disease? What happens if it is not treated? The bone disease usually increases in extent and severity, and finally, after some years, the joint becomes ankylosed; the pain ceases and the patient is comfortable for life. If he chooses that, and you agree, well and good. The joint will not then need any mechanical or surgical treatment. If the patient does not choose that course, then you must choose between mechanical and surgical treatment of this joint. If, perchance, the focus of the disease is found and removed and the disease ceases, the joint will recover and be in as good condition as it ever was so far as function and position are concerned. If not, the deformity will go on, and it is the function of the orthopedist or the general surgeon to prevent the development of the deformity and lessen the pain. These chronic joint inflammations should be treated in the same way as a chronic tuberculous joint is treated, by immobilization and more or less protection for a certain period. So long as there is a tendency to the development of deformity, the joint should be held in the position for greatest comfort and best function and kept immobilized for months or even years. When the patient can stand without pain or discomfort in his immobilization apparatus and when much of the swelling and irritation found locally have disappeared, then I am accustomed to relieve the patient of his immobilization and test out the condition of his joint. Experience is the only guide in choosing the time for this, but there is no need of worrying too much about immobilizing these cases, even if they become ankylosed, because they will become ankylosed whether they are immobilized or not. The point to be remembered is that if the ankylosis occurs, the joint should be in the best possible position. If there is a deformity it can best be corrected at one sitting by force, anesthetizing the patient and then immobilizing the joint until all the soreness resulting from the manipulations has passed. In the case of the hip, the leg should be in slight flexion and the shortening which usually results from destruction of a hip-joint is compensated by a certain degree of abduction. The spine should be straight. The knee should be slightly flexed. In the case of the spine, it should be straightened out and held until it stays in position of itself. This should be done at once, or by repeated applications of force and plaster of Paris, forcing while the plaster is setting. I do not think that such patients should be operated on. The point is, however, that the patient should know that he is the one to choose. He should also know that he may have a good result without an operation.

Dr. Bransford Lewis, St. Louis: In my own experience the posterior urethra is infected in over 90 per cent. of all urethral gonorrheal infections. Of late infections of this kind have been better controlled by the less irritating silver solutions, such as argyrol, nucleinate of silver, and so on; but at the same time, we cannot fail to observe the enormous frequency with which these parts of the tract are infected. Another phase of material importance is the fact that the infection is often not of venereal origin, and therefore apt to be overlooked by one who is not particularly searching in his examination. Even if a patient of this class pass all his urine into two glasses and both are clear, pus that comes from the seminal vesicles may fail to be observed. If you let the patient pass two glasses of clear urine, then massage the prostate and after this have him urinate again, and then find the urine cloudy, containing enormous numbers of pus-cells and possibly numerous gonococci or other microbes, you can determine with certainty as to whether he has seminal vesiculitis. Another point of importance is that in doing the massage of the prostate the patient should be told to place a little butter-platter under the meatus and catch whatever passes out from the urethra. This is subjected to the several steps of examination. By means of massage and heat, irrigations and the use of vaccines we can control these cases better than we used to when we did not have these methods of treatment. In the absence of success with these the operative method is resorted to, and I have used the one described by Dr. Young and found it entirely satisfactory. If only one point is remembered in connection with this subject, it should be that we must detect the focus of infection, which may have persisted for one, ten or fifteen years. By doing so it is possible to clear up a case in which the patient has been a sufferer from a disease which has been beyond the reach of ordinary surgical measures.

Dr. D. N. Eisendrath, Chicago: Not enough emphasis has been laid on the kidney in this symposium. There are so many cases which reach the general practitioner in which there is absolutely no localizing sign pointing to the kidney as the source of the infection. These cases may run along, sometimes for weeks or even months, with a temperature of from 99 to 104 F. and with no evidences of toxemia in the joints, but rather in the body in general. These are the cases that puzzle so many of us, and they are the cases that are so frequently treated and called, for lack of a better name, low typhoid, chronic malaria and cryptogenetic infection. Especially are these the cases in which the patient has been observed for a long time, with low-grade toxic symptoms, and then suddenly the fire flares up, the patient has a temperature of 103 and 104, but still there is no sign of kidney disturbance. Therefore, if we will only consider the kidney—in fact, the urinary tract—in making the differential diagnosis, we shall often clear up a mysterious case, and be able to benefit the patient. It is only by a process of exclusion, by examining the urine carefully, that we can make a correct diagnosis in many cases of chronic joint infections.

THERAPEUTIC PNEUMOTHORAX AS A PALLIATIVE MEASURE, SAFEGUARDED BY STEREOROENTGENOGRAMS

A REPORT OF TWENTY CASES FROM THE CINCINNATI TUBERCULOSIS HOSPITAL *

KENNON DUNHAM, M.D.
Visiting Physician Cincinnati Tuberculosis Hospital
AND
CHARLES S. ROCKHILL, M.D.
Superintendent and Medical Director, Cincinnati Tuberculosis Hospital
CINCINNATI

This paper is not an introduction to artificial pneumothorax or a history of its use or technic. These points have been brought forward with increasing interest and detail since Forlanini's first published suggestion of the value of this treatment in 1882. Murphy, Brauer, Speagler, Saugmann, Schmidt, Lemke, Robinson and Floyd, Weiss, Hamman and Sloan, and many others have added valuable studies to our literature, and it is becoming a recognized method of treatment in some of our more advanced clinics and sanatoriums.

This report of twenty cases treated in the Cincinnati Tuberculosis Hospital and our deductions from the work there is intended to emphasize two things: (1) the value of this treatment as a palliative measure, and (2) the value, almost the necessity, of safeguarding the treatment by the use of the Roentgen rays. We attribute the good results and the lack of difficulty encountered in our treatment of these cases to our implicit following of the established technic as outlined by Hamman, and by the constant counterchecking and studying of the cases during the whole treatment by stereoscopic chest-plates.

In emphasizing therapeutic pneumothorax as a palliative measure we do not deny its value as a curative one, but we feel that we have not had sufficient time, experience or results to attribute to it this superlative value.

Exactly of what does this treatment consist in its present development, and what are the indications for its use?

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* Read in the Section on Pharmacology and Therapeutics of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

Artificial pneumothorax is the introduction into the intrapleural space of an innocuous, slowly absorbable gas, which will collapse the diseased lung. The treatment is repeated until the clinical symptoms warrant the gradual cessation of the injections and the consequent normal reinflation of the lung.

This collapse and forced rest or immobilizing of the lung is indicated by the proved value of rest in the treatment of all tuberculous infections. Perhaps Nature, too, has given her suggestions as to palliative measures for tuberculosis, in the restricted muscular action of the chest, the pleuritic effusion, the hydropneumothorax and the closing of a large lesion with the drawn-over heart, often found in these cases.

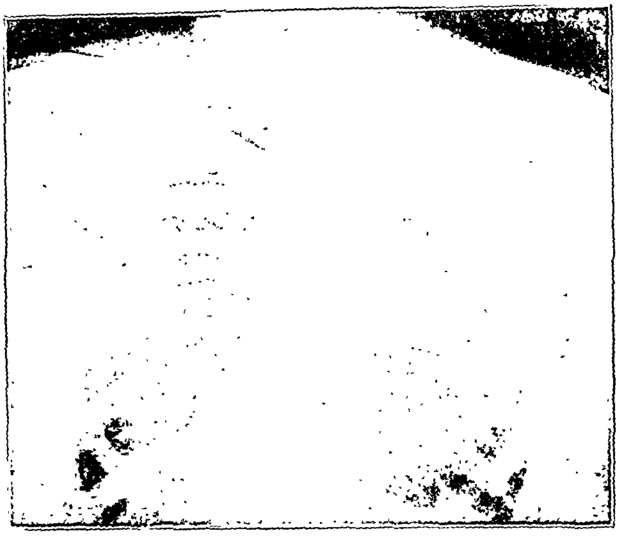

Fig. 1 (Case 1).—Before collapse.

The lack of contra-indications in properly selected cases is the best recommendation for induced pneumothorax. The operation is simple, the danger slight, the shock nil, and the effects most satisfactory.

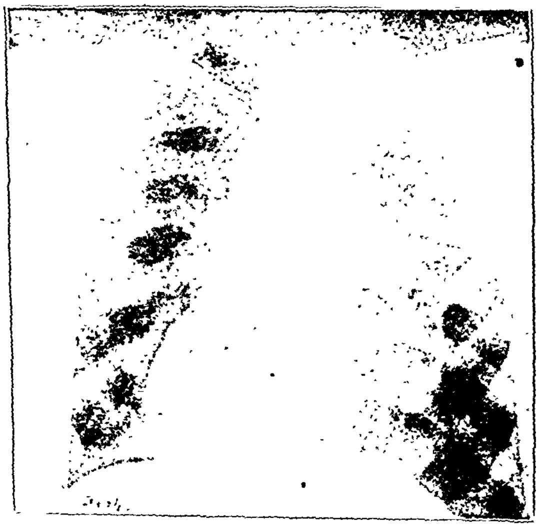

Fig. 2 (Case 1).—After collapse.

The results and effects of this therapy are positive. The principal pathologic findings after collapsing the lung are that the cavities are emptied in part or in whole according to the extent of the pleural adhesions, caseous areas have become cicatrized, and above all, an extensive overgrowth of the fibrous tissue is permitted during the enforced lung rest, which is Nature's best method of healing such a condition.

The clinical effects of pneumothorax are most encouraging, and are really what we have been working for, in the absence of definite proof that we might obtain a cure by this treatment.

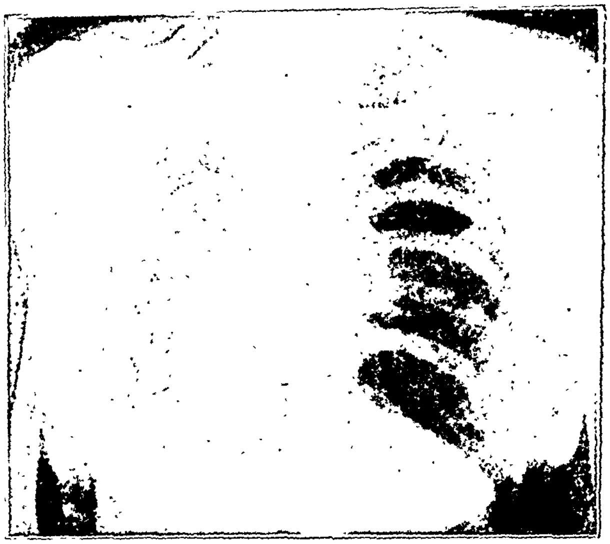

Fig. 3 (Case 2).—Before collapse.

In the first place, with the introduction of the nitrogen, the lung collapses, except where held out by pleural adhesions. Any pain which follows injection is always due to the stretching of these pleural adhesions. Pleural bands have invariably been made out in close proximity to an indicated area of tenderness. The pain is always sharpest just after refilling and gradually becomes duller. It is remarkable, but true, that a patient suffers no other pain and comparatively little inconvenience of any kind, even when a whole lung is collapsed to a mere solid mass lying close to the spinal column. With the progressive treatment, all detrimental symptoms abate. The diminished amount of retained infectious material shows the usual results of lessened toxic

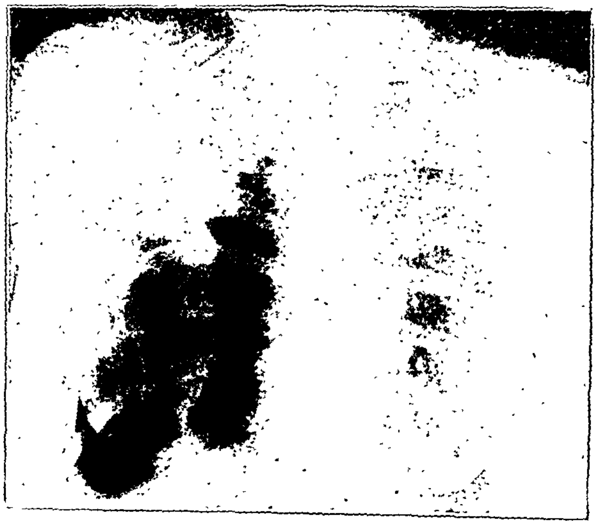

Fig. 4 (Case 2).—After collapse.

absorption—a fall in temperature and a reduced number of night-sweats, increased strength and appetite and final gain in weight. In addition, both the cough and the sputum are greatly lessened, and the elimination of the tubercle bacilli makes the patient less a source of infection; but the value of the treatment is best seen when a restless, despondent, hectic, emaciated, dependent cripple is transformed into a live, happy, resourceful being, who sleeps and eats well, and who goes about the grounds recommending the treatment to all who will listen.

These possibilities are facts. We have four such patients who have resumed work with our permission and two who have done so without it. It is a common thing for our patients to dress themselves after a filling and walk some distance to their wards; several even

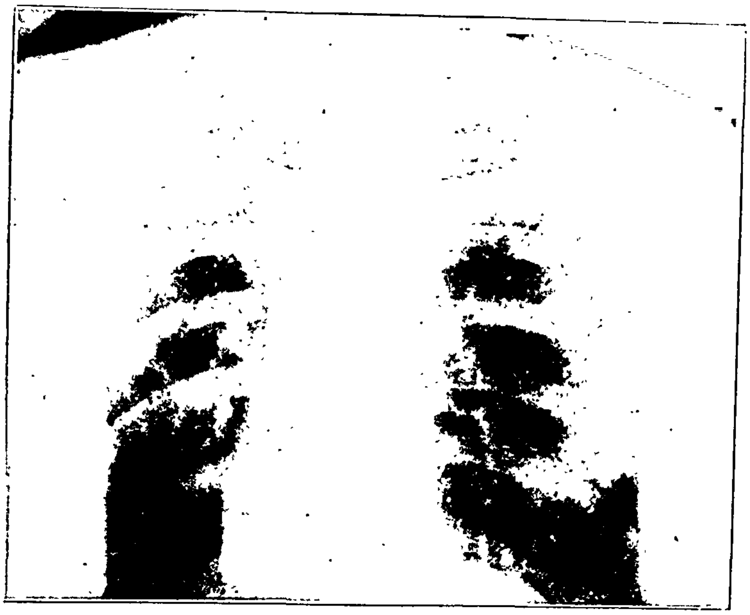

Fig. 5 (Case 7).—Before collapse.

Local anesthesia, perfected apparatus, accurate technic, careful asepsis, the ability of the one lung to collapse and of the other to carry the double burden, and the accessibility of the patient for the necessary refillings, form the most important items. The careful selection of cases (not very determinate as yet) often predestines success, and the Roentgen rays prove that refilling should be frequent and the gas-pressure slight, the amount of gas injected being just sufficient to keep the lung collapsed and no more. If the negative pressure is raised to zero we have found it to be more than enough.

We should like to dwell on each and every one of these essentials for success, but they and the dangers or complications encountered have been adequately written up so recently that we think it will be sufficient merely

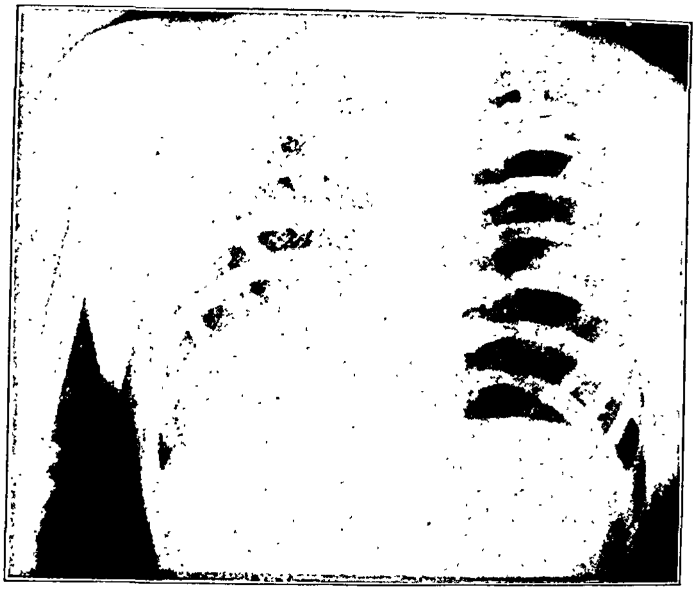

Fig. 7 (Case 12).—Before collapse.

First. Heart-misplacement and therefore derangement of blood-supply, a strain of the aorta, or a kink in the vessels resulting from too great pressure.

Second. Break in the mediastinum, from too great a pressure.

Third. Gas embolism, which might result from a puncture of the lung and the needle entering an artery. The possibility of this can never be entirely done away with, in using Forlanini's thoracentesis, but careful watching of the manometer and skilful manual technic will reduce this risk beyond the necessity of employing Brauer's thoracotomy, in our opinion.

The fourth danger is that of infection of the pleural cavity and resultant pleural effusion, and suggests a break in the asepsis. Effusion occurs in about one half of the generally reported cases.

The fifth, emphysema, is really more an inconvenience than a danger.

A sixth danger, abnormal conditions, has been avoided by never giving an injection during the menstrual period or just following a debauch.

From this consideration of the essentials for success and the hindrances to the success of artificial pneumothorax in the treatment of pulmonary tuberculosis, we can deduce this much: The treatment is certainly palliative, as a rule, and offers relief when usual methods of treatment have been unsuccessful. It is of especial value in the control of pulmonary hemorrhages. While it will possibly never become a routine treatment for consumption, its use will certainly be indicated for those with quiescent lesions on one side and acute recrudescence of the other, and for such advanced cases as may at least profit by the certain amelioration of clinical symptoms. Our opinion is that eventually it will be utilized for much earlier lesions, and the collapse will be obtained by more radical surgery, when the pleural cavity is obliterated by adhesions.

If we stop here, however, we have progressed very little farther than our predecessors. Our first point was to prove artificial pneumothorax a palliative measure; our real advance was to show how the constant use of the Roentgen ray in the treatment predetermined success and prevented disaster.

By the use of stereoscopic roentgenograms, we have been enabled to select cases, to watch the progress of the disease, to determine the extent of the lung collapse, to note the pressure on the heart and mediastinum, to exclude pleural effusion, and to safeguard the unfilled side.

From roentgenograms, as from physical examinations, we cannot ascertain whether we may or may not enter the pleural cavity. Of course the plates show us the fibrosis, and we know that when there is but a small amount of connective tissue entrance is usually easy, and when there is great fibrosis, entrance is difficult or impossible; but among the intermediate cases it is hard to differentiate.

The roentgenograms, however, do give us accurate information when percussion and auscultation fail; for we have learned from stereoscopic roentgenograms that it is almost impossible to map out accurately the extent of pneumothorax by percussion, because in some cases the lung is collapsed anteroposteriorly and in others from the mediastinum toward the chest wall; in others the lung is adherent to the chest wall as a streamer, collapse taking place around the various attachments, whereas complete collapse from chest wall to mediastinum is rather the exception. It is of great interest in any of these cases to watch the cavities becoming gradually *obliterated* by successive injections of the gas. The position of the heart cannot always be made out by percussion or auscultation either, as it is frequently pushed from the left posteriorly, rather than altogether from the left to the right. In short, these conditions can be accurately determined only by the Roentgen rays. Also, it is a great satisfaction to us to be able to say that in no case in which the gas has been injected has pleural effusion developed, and we are very glad to have our roentgenograms to substantiate our statement; but perhaps the greatest value of roentgenography here lies in being able to watch the progress of disease in the uncollapsed side.

We now present the report of twenty cases from the Cincinnati Tuberculosis Hospital in which we have given treatment with therapeutic pneumothorax as a palliative measure, safeguarded by the use of stereoroentgenograms.

Of the twenty cases treated six cases should not receive consideration as a palliative treatment for pulmonary tuberculosis. Two patients refused further treatment after the first injection, and in four cases we did not gain a satisfactory entrance into the pleural space, so that of the twenty cases treated we have fourteen which represent at its best therapeutic pneumothorax in pulmonary tuberculosis. The accompanying tabulated classification of the cases will present them perhaps more clearly.

CLASSIFICATION OF CASES

Condition before treatment:	
Unilateral	1
Bilateral	19
Hemorrhage cases	6
Cavities without hemorrhage	5
Cavities with hemorrhage	5
Condition during treatment:	
Failed to get in	4
Pleural successfully found	16
Filled but once	2
Results of treatment:	
Gained in weight	6
Losing in weight	6
Neither lost nor gained	2
Gained but now losing	3
Activity opposite side increased	1
Sputum reduced	14
Tubercle bacilli in sputum reduced	9
Sputum became negative	5
Cough reduced	14
Temperature reduced	10
Hemorrhages recurred after treatment	1

REPORTS OF CASES

CASE 1.—Motorman, aged 32 (Figs. 1 and 2). Bilateral lesion; right side most extensive. Has had numerous severe hemorrhages. Collapsed right side. Hemorrhages and cough controlled; fever normal; gained in weight. Had a relapse with hemorrhage during car strike, but has recovered. Is now doing well.

CASE 2.—Woman (Figs. 3 and 4) has bilateral lesion most marked on left side. Cavity in left upper. Has had several very severe hemorrhages. Left side collapsed. Cavity closed by pressure from mediastinum to lateral wall. No hemorrhage since first injection. Patient is doing well, but there is evidence that the disease is extending in right side.

CASE 7.—Man, aged 34 (Figs. 5 and 6). Bilateral, left most extensive. Many severe hemorrhages which have entirely ceased since first injection. Cavity is much reduced and patient is doing well.

CASE 12.—Woman, aged 18 (Figs. 7 and 8), had all symptoms of florid phthisis; temperature 104, etc. Examinations showed bilateral lesion with cavities in upper left. Left side completely collapsed, cavity emptied. Patient gained 12 pounds. Temperature normal. Sputum negative, cough reduced.

ABSTRACT OF DISCUSSION

DR. CHARLES L. MINOR, Asheville, N. C.: This subject is so vast in scope that I cannot possibly go into its details as I should like to do. The essentially important matter is the proper use of the manometer as a guide to the performance of the operation. Anybody working without such an instrument is criminally negligent, for air embolism may occur and may suddenly be fatal, whereas by the use of the manometer it should become almost impossible. When the needle has been introduced into the chest no one with any prudence will turn on the gas until he has first connected to the needle the manometer and seen whether or not there are negative fluctuations of air amplitude, usually at least 1 cm. If these are present, he can safely turn on the gas and allow it to flow. Further, the pressure of the gas in the chest should be tested on the manometer after each 100 c.c. have flowed in. In this way it is possible constantly to know the intrathoracic pressure and to avoid raising it too high. That this may be dangerous is proved by the fact that there is a case on record in which overpressure caused the gas to break through the mediastinum and produce a double pneumothorax. The safe pressure to use is something under 200 c.c. of water; I have gone as high as 170 or 180 c.c., but others have gone well above 200 c.c. without bad effect. Whatever the pressure indicated, if severe pain and marked shortness of breath occur, the operation should be temporarily stopped, but moderate pain is quite natural and can be disregarded. One of the great troubles of the operation is that, in some cases, the other lung wakes up into activity and causes the operation to be a failure. To avoid this, we should be careful to introduce the gas slowly, not over from 1 to 300 c.c. at the first operation, although Dr. Brauer uses as high as 1,800 c.c.; gradually increasing the amount of gas each time, we can introduce much larger quantities, but, as Dr. Durham has noted, it is not necessary to do more than keep up a moderate pressure in order to keep the bad lung collapsed. I do not, however, agree with him that the pressure should not be positive, but only neutral.

It is not a question of the number of cubic centimeters which you put in, but of the amount of pressure you produce. Reinjections should occur at first every two or three days, but finally at longer and longer intervals until they come every two or three months. As fibrous tissue forms, however, so much pressure is not needed to keep up collapse. The general rule is to keep the pressure up in the chest for from one to three years, when it is allowed slowly to reexpand. There is a tendency in this country to be too radical in the choice of cases, but, at present at least, this procedure should be confined to hopeless, advanced cases in which no other measure is applicable; patients who, in all probability, are going to die, but in whom the good lung is only moderately involved are excellent for the application of the procedure. The ideal indication is a destructive process *in one lung with the other lung in excellent shape.* Another indication is uncontrollable hemorrhage, which at times it stops with marvelous rapidity. The apparatus can be home-made for about nine dollars or bought from a dealer for forty dollars.

Dr. C. K. Roys, China: Have you used oxygen instead of nitrogen?

Dr. Kennon Dunham, Cincinnati: Oxygen is absorbed more rapidly than nitrogen. Some operators advise that oxygen be used to avoid air embolism on the principle that if it enters a vein and is carried into the circulation it will be absorbed quickly and no harm result. Air embolism is best avoided by an intelligent use of the manometer and reliance should not be placed on the character of the gas used. I purposely avoided describing the manometer and its readings because that has been so perfectly done by Hamman and Sloan. Two men should be associated in this work. When I am here Dr. Rockhill stays at home and sees that the patients are properly filled and vice versa.

I desire to emphasize the comparatively slight pressure necessary and the slight pressure advisable. When we go from a negative pressure to a neutral pressure we have usually gone far enough and *a slight positive pressure is all that is ever permissible.* I am sure that within a year Dr. Minor will be advocating this point of technic as strongly as we are. Much trouble has been unnecessarily caused by the great amount of gas injected and the high positive pressure obtained. With a patient lying comfortably *on the table* and the manometer recording perfectly, there is great temptation to inject a few hundred more cubic centimeters of gas. This may be just enough to cause undue pressure on the opposite side and to prevent the perfect recovery which should have been expected. Finally, the patients gain weight, eat better, sleep better, suffer less and more generally improve if attention is given to securing just the necessary amount of pressure and no more.

ETHER PERCENTAGES *

WALTER M. BOOTHBY, A.M., M.D.

BOSTON

Surgical anesthesia depends on the establishment in the blood and tissues of a definite ether tension, corresponding to about 15 per cent. of ether vapor in the alveolar air. My experience with the Connell anesthetometer, as well as the physiologic observations of Waller of London University, has demonstrated the fact that the "anesthetic tension" varies very little in different patients—the strong, robust alcoholic requires little, if any, greater ether tension than does a child for the same degree of anesthesia.

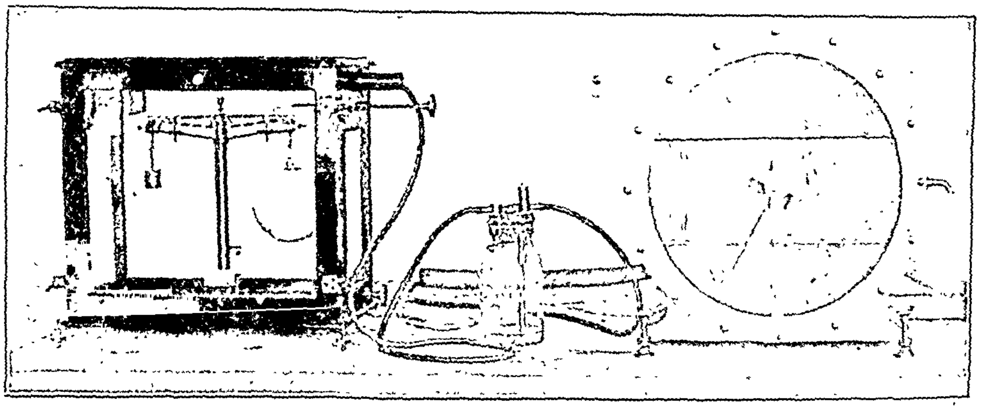

Fig. 1.—Apparatus for determining percentage of ether vapor obtained by passing air over liquid ether.

In order to induce anesthesia quickly, air containing approximately 30 per cent. of ether vapor should be administered for a period of from two to twelve minutes, depending on the size of the subject in relation to the rapidity of his circulation and respiration. By the early administration of strong ether vapor, diffusion occurs more rapidly from the inspired air, through the walls of the alveoli into the blood, allowing the latter in its turn to more quickly bring about in the tissues the tension of ether vapor requisite for surgical anesthesia. As the required tension is approached, the ether vapor in the inspired air is gradually reduced to 15 per cent. If less than 15 per cent. ether vapor is administered, outward diffusion occurs from the tissues and blood to the air and the anesthesia becomes lighter. On the contrary, the continuous administration of 15 per cent. ether vapor after the "anesthetic tension" is once established does not mean that the patient is receiving more ether, but merely that diffusion both in and out is prevented; in brief, a state of equilibrium is established, and so long as it is maintained a condition of safe ideal surgical anesthesia will exist.

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* Read in the Section on Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

* From the Surgical Service and Respiration Laboratory of the Peter Bent Brigham Hospital.

* Because of lack of space, this article is abbreviated in The Journal. The complete article appears in the Transactions of the Section and in the author's reprints.

Without question the anesthetomoter devised by Dr. Karl Connell of Roosevelt Hospital, New York, is the ideal apparatus to use. By it the "anesthetic tension" can be rapidly obtained and indefinitely maintained. Unfortunately this apparatus is not available to every one, and it seemed to me desirable that the ether percentages as obtained by the use of our more common forms of apparatus should be determined experimentally. This I have done, as well as to correct—in the light of our new knowledge—some of the erroneous beliefs which are so generally accepted in regard to ether anesthesia.

DESCRIPTION OF APPARATUS

Figure 1 represents the apparatus as set up for determining the percentage of ether vapor obtained by passing air over liquid ether contained in a Woulfe bottle and other "vapor" apparatus. On the left is the Waller gas balance calibrated to read off ether percentages from 1 to 50 direct.

In the center is represented the Richardson ether vapor apparatus; in the experiments, however, I used a 1-liter (1-quart) Woulfe bottle because the thermometer could be introduced into the liquid ether more conveniently by means of the middle opening; the bulb of the thermometer was always submerged.

On the right is shown a Bohr 10-liter gas-meter by which the volume of air per minute used during the experiment was obtained.

EXPERIMENTS AND EXPLANATION OF CHARTS

The air was passed through the meter, from the air-main in the laboratory, at a constant rate; taken over the surface of the ether and from there to the gas-balance. The temperature of the liquid ether and percentage of ether vapor were taken simultaneously.

In the chart (Fig. 2) the upper line represents the percentages, and the lower line the temperatures obtained when the air was run at from 4 to 6 liters per minute. The ordinate represents temperature and percentages; the abscissa time in minutes. While the ether is comparatively warm the percentage as recorded by the balance rapidly rises from 0 to 31 and then begins to fall slowly and parallel to the fall in temperature. If the percentage curve is extended backward as represented by the dotted line, it will be seen that at first the ether vapor was very strong—about 52 per cent.—corresponding to a temperature of the liquid ether of about 18 C. (64.4 F.).

Figure 3 is similar to Figure 2 in every respect, the more rapid rise and fall being due to the fact that the rate of flow of the air is twice as fast (10 liters per minute). The percentage curve extended backward by the dotted line gives 56 per cent. for a temperature in the liquid ether of 20 C. (68 F.).

Figure 4 represents an experiment in which the rate of air-flow was increased to 18 liters per minute. This rate corresponds pretty closely to that which an anesthetist would produce by his use of a foot-pump in a case in which the patient is difficult to etherize, for under such circumstances his tendency is to pump faster and faster. It is evident that such rapid pumping (and in deep breathers large volumes are necessary) defeats the very purpose for which it is done, because the large amount of air passing over the ether causes the latter to evaporate very quickly. As a result, the temperature of the liquid ether falls quickly far below 0 C. (32 F.), and therefore the amount of ether vapor in the air is less than 15 per cent. Concisely put, the faster the anesthetist pumps the lower will be the ether percentage obtained and the greater the difficulty, if not impossibility, of etherizing the patient. After the experiment had been continued for thirty-seven minutes the Woulfe bottle was placed in a water-bath at a temperature of from 35 to 37 C. (95 to 98.6 F.), with the result that the temperature of the liquid ether immediately rose and the percentage of ether vapor increased correspondingly. In the chart I have indicated by the heavy dotted line the percentage of ether necessary to induce and maintain anesthesia for the first hour in an operation for cerebellar tumor. The distance between the two curves, the upper representing the percentage needed and the lower the actual percentage obtained from passing air over liquid ether, illustrates forcibly the reason that an ordinary apparatus will often not anesthetize a patient. The advantage that can be obtained by immersing the ether bottle in warm water is as strikingly shown by the rise in the ether percentage.

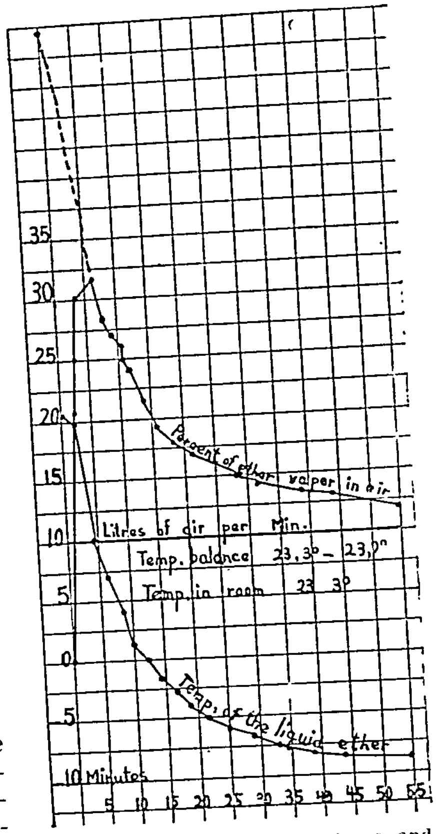

Fig. 3.—Chart of percentages and temperatures. Feb. 18, 1913. Same apparatus.

Furthermore, the fact that throughout the entire experiment the temperature in the balance varied less than 1 degree proves conclusively that any change produced by the warming device cannot be attributed in any way to a change in temperature of the inspired mixture of air and ether. This experiment confirms the earlier work of Cotton and Boothby[1] on the fallacy of warming the inspired air so far as affecting the patient by the temperature is concerned; the present work goes farther, however, and gives the true explanation of the practical value of immersing the bottle containing the ether in a bath of warm water.

Figure 5 illustrates the effect of immersing the ether bottle from the start in a water-bath at from 35 to 37 C. (95 to 98.6 F.), with the air flowing at 15 liters per minute. By this means we obtain much higher percentages, so high, in fact, that from the practical point of view, when a water-bath is used, care must be taken to dilute the mixture in some way before it is inspired by the patient.

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[1] Cotton and Boothby: The Uselessness of Warming Anesthetic Vapors, Surg., Gynec. and Obst., 1912, xv, 724.

Figure 6 shows the percentage that would be obtained at a slower rate of air-flow. If a still slower rate was used a still higher percentage would be obtained for a longer time, because the liquid ether would not become so rapidly cooled by its quick evaporation. It must be remembered, however, that the patient may get two or three inspirations consisting of 50 per cent. ether unless care is taken to prevent this. Although no such great danger is present from the inhalation of strong ether vapor as there is of chloroform, yet it should be avoided. For this reason one must never use chloroform in this manner for the well-known reason that one single inspiration of concentrated chloroform may instantly and permanently stop the heart. I have frequently seen a chloroform bottle and ether bottle immersed in a water-bath in the same air-circuit, so that by the simple turning of a valve the air is made to pass over the chloroform instead of the ether; the purpose of this combination is to control patients difficult to anesthetize with ether.

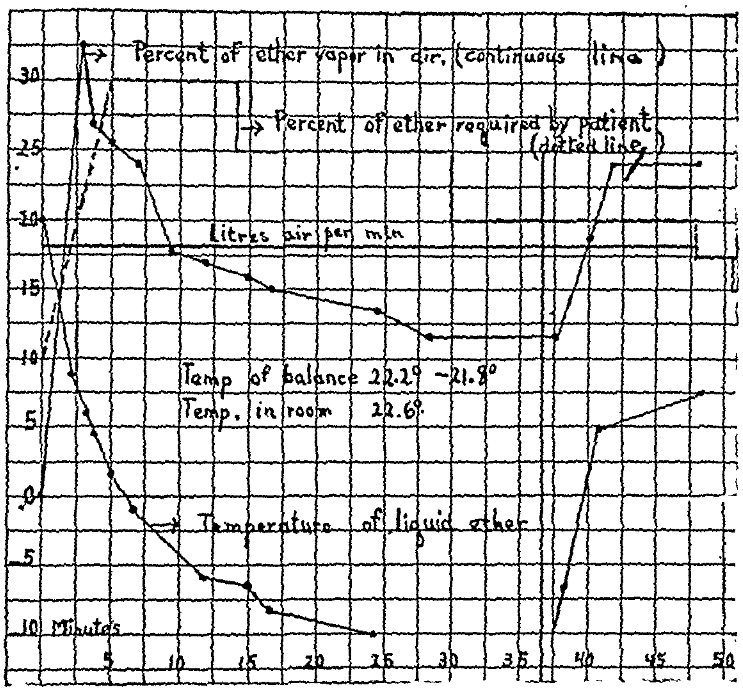

Fig. 4.—Chart of percentages and temperatures. Feb. 18, 1913. Same apparatus. At 37½ minutes the bottle of ether was immersed in water at 35 C. (95 F.).

No such difficulty should exist if an ether bottle of sufficient size (1-quart jar about half full) is used and immersed in water at 35 C. (95 F.). As the boiling-point of ether is 35 C. the water should never exceed this temperature. The water cools rapidly and must be kept up to 35 C. by constant addition of warm water by an attendant or by a small electric heater. Water at 35 C. will keep the liquid ether at a temperature of about 15 C. (60 F.) for the average rate of flow of air; at this temperature 45 per cent. ether vapor if undiluted with air can be obtained, a percentage far stronger than that which ever should be used without dilution.

In Figure 7 I have plotted the curve of the vapor tension of ether at different temperatures as determined by Regnault.[2] For comparison I have put in the points as determined by me in the preceding experiments. Many of my points fall directly on the true curve and most of the rest very close to it. The general close agreement between my experimental results and the true curve of the vapor tension of ether substantiates in a very satisfactory manner the fundamental correctness of my observations and deductions therefrom.

This curve can be made of practical use by placing a centigrade thermometer in the liquid ether of the vapor apparatus. At any given temperature of the ether one may be sure that one is obtaining the corresponding ether percentage; then if one has a valve which will accurately shunt the air-current so that one-fifth, one-fourth, one-third, etc., can be passed over the ether and the rest around the ether, a close approximation of the ether percentage which the patient is getting can be readily estimated.

NEW METHOD OF DETERMINING ETHER PERCENTAGES OBTAINED FROM A MASK

I shall now give a brief consideration to the ether percentages obtained from a mask. On account of the size of the dead-space of the balance, the readings taken will give only the average of a considerable number of respirations. Therefore the results obtained must only be considered as an average, since individual inspirations may be irregularly higher and lower.

For this problem I have arranged the apparatus shown in Figures 8 and 9. The artificial mouth and trachea of the patient consists of two brass tubes of ¾ inch diameter; one of these is used for "inspiration" and the other for "expiration." The tube for inspiration has a series of eight thermometers spaced at intervals of 2 inches, the first being directly at the mouth. The air is conducted back to the mask by the other brass tube containing water to saturate the air with moisture. This method affects the mask with warmth and moisture in the same manner as expired air, and yet does not influence the thermometers; therefore the temperatures as taken from the intake tubes will give a very fair indication of the temperature of air and ether as inspired by a real patient. The brass tubes or "artificial trachea" are immersed in a water-bath kept at a constant temperature of 37 C. (98.6 F., body temperature) by means of a small electric heater shown lying outside the bath. The mask used is placed on a little shelf that acts as a "face" and the mouth of the trachea opens directly under it. Ether is administered by a small constantly running stream, regulated to the desired amount by a stop-cock from the little glass container shown over the top of the hose; a glass tube, which can be easily moved, takes the ether to the mask and distributes it over the mask. The hand-pump was especially made for me, and by means of a check-nut can be set so that a single stroke will give any amount desired up to 1,500 c.c.; the number of strokes per minute and therefore the volume per minute are regulated as desired. The pump sucks in the air through the intake tube from the trachea and delivers it through the outlet tube to the balance; from the balance the air passes back through the second trachea to the mask.

In Table 1 are shown four of the many experiments by this method. During the stage of induction which requires 30 per cent. ether, the temperature of the inspired mixture falls to 12 C. (53.6 F.); as soon as anesthesia is induced, 19 per cent. ether is sufficient, and with this percentage the temperature rises to 23 C. (73.4 F.).* Still later, when only 15 per cent. ether is needed, the temperature would be even higher.

The well-known increase in depth of respirations in alcoholics appears to be due to the greater excitatory power of ether on the respiratory center in such subjects than exists in the case of non-alcoholics. The more expert the anesthetist the less excitatory effect does the ether have, and the easier it is to induce anesthesia. It is very hard for the beginner to increase the percentage of ether rapidly and yet smoothly without causing "suffocation" and therefore deep breathing on the part of the patient.

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[2] Regnault: Chem. Kal., 1912, ii, 105, Table 77.

* Room temperature equals 24 C.

The difficulty of obtaining the high percentages requisite for the rapid induction of anesthesia in a deep breather is as great experimentally as it is in actual practice. The third experiment cited in Table 1 illustrates the tremendous amount of ether that must be poured on the mask to bring 24 liters of air per minute up to 30 per cent.

The words "on" and "off" after the percentages indicate the advantages to be obtained from a little anesthetic trick that deserves better recognition: namely, the greater ether percentage that can be obtained by placing the hands on the mask; the warmth of the hand aids the vaporization of the ether as well as preventing a leakage of air around the bottom of the mask. In practice I put a hand on one side of the mask and drop the ether on the exposed side, reversing sides about once a minute.

TABLE 2.—CALCULATION OF AMOUNT OF HEAT LOST BY RESPIRATION DURING ETHER ANESTHESIA

(Open wire mask with 16 layers gauze.)
Assumptions (based on experimental evidence):
Vol. of respired mixture (average): 10 L. per min., 600 L. per hour.
Containing: ether (average): 16 per cent., 96 L. per hour = ¾ lb (approximately).
Containing air (average): 84 per cent., 504 L. per hour.
Temperature of mixture as inhaled at mouth: 15 C.
Physical data:
Liter weight of ether: 3.53 gm. Specific heat of ether: 0.4796.
Liter weight of air: 1.29 gm. Specific heat of air: 0.2374.
Formula used:
Vol. × L. Wt. × Sp. Ht. × Deg. = Gm. calories lost.
Calculation.
Ether. 96 × 3.53 × 0.4796 × 22 = 3575 gm. cal. = 3.6 calories.
Air. 504 × 1.29 × 0.2374 × 22 = 3393 gm. cal. = 3.4 calories.
7.0 calories.

Careful consideration of all factors involved shows that there is practically no change from the average loss of heat by the vaporization of water from the lungs.

Vierordt gives the following average values of heat elimination:

	Daily Cal.	Hourly Cal.	Per Cent.
1. By urine and feces	47.50	1.98	1.8
2. By expired air: (*a*) warming air	84.50	3.52	3.5
(*b*) vaporization of water	182.12	7.59	7.2
3. By evaporation from the skin	364.12	15.18	14.5
4. By radiation and conduction from the skin	1,791.82	74.65	73.0
	2,470.82	102.92	100.0

These experiments explain away the apparent contradiction between the clinical fact that large, vigorous people, especially if alcoholic, need a great quantity of ether to produce anesthesia, and the physiologic law that all persons require the establishment in the body of approximately the same tension of ether vapor to produce the same depth of anesthesia. A recognition of this fact transfers the blame for a difficult and bad ether from the patient to the technic and ability of the anesthetist.

The question of the loss of heat directly attributable to the administration of the anesthetic mixture during an operation is one of importance. If there is an undue loss, effort should be made to prevent it; but if the loss proves to be comparatively small and therefore negligible, attention should be directed to more efficient and natural means of conserving the body heat.

The complete calculation is given in Table 2. It is evident that a loss of about 3½ calories per hour can be attributed directly to warming the ether, and an equal amount of bringing the temperature of the air itself up to body temperature. This makes a total of 7 calories; Vierordt assigns 4 calories as the normal amount.

It is more difficult to estimate the amount of heat eliminated through evaporation of water in the lungs. A consideration of the following facts leads to the conclusion, however, that little, if any, variation from the normal occurs. The points to be considered are:

Reference to Vierordt's figures at the bottom of the table will show that the normal elimination of heat by the lungs totals about 11 calories. During ether anesthesia it cannot at the outside be more than 16 or 17 calories, or an increase of 5 or 6 calories.

To contrast with these figures we must consider the amount of heat eliminated by the skin in the same period. Vierordt gives for this an average of 90 calories an hour. The danger to the patient of losing an undue amount of heat from the skin by evaporation, radiation and conduction is far greater than can take place from the lungs.

The conclusion seems inevitable that our attention should be directed to keeping the patient dry and warmly covered, and not to the procedure of warming the anesthetic mixture. Such warming of the inspired air is futile from the point of view of thereby sufficiently preventing a lowering of the body temperature during a surgical operation.

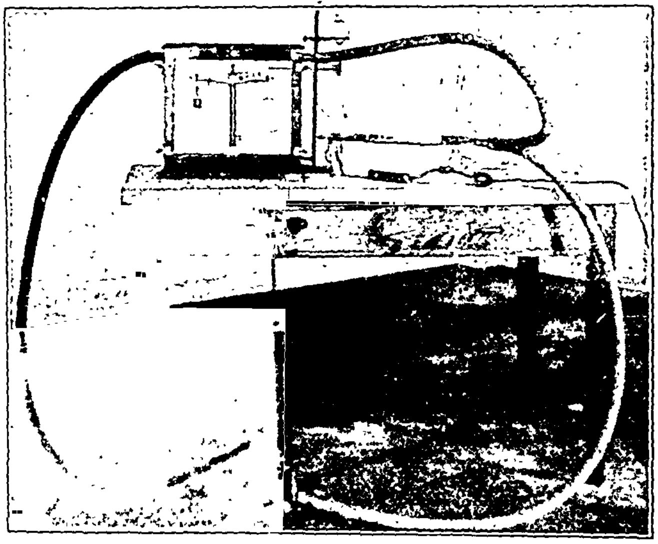

Fig. 3.—Apparatus for determining ether percentages from a mask, complete.

SUMMARY

I. 1. Apparatus and experimental details are given for determining the ether percentages that are obtained by passing air over liquid ether.

2. The advantage of keeping the liquid ether warm is demonstrated and the beneficial action of the procedure explained by showing the effect on the ether percentages obtained and the want of effect on the temperature of the inhaled mixture.

II. 1. A new method of determining the percentages of ether vapor and the temperature of the inspired mixture as obtained from a mask is described. The method used is considered to give results comparable to the percentages and temperatures existing in actual clinical etherization.

2. Clinically it is known that large, vigorous (alcoholic) patients require a great quantity of ether poured on the mask to produce anesthesia. Physiologically it is recognized that essentially the same tension of ether

vapor in the body produces in all subjects the same depth of anesthesia. It is pointed out that the clinically difficult cases are those in which the patients are deep breathers, those whose volume of air respired averages over 20 liters instead of below 10 liters per minute. The apparent discrepancy between clinical experience and the physiologic law, therefore, consists in the difficulty of the anesthetist in bringing such a large volume of air up to the percentage of ether required. In short, the anesthetist and not the patient is to blame for a difficult and bad ether.

III. From a calculation of the loss of heat directly attributable to warming anesthetic vapors, it is demonstrated that such loss is negligible in comparison to that from the body surface. Consequently it is futile to warm the anesthetic vapors.

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ADMINISTRATION OF ALKALOIDS BEFORE ANESTHESIA *

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In the older records in medical literature there is abundance of evidence that many of the drugs which are employed to-day and which we are prone to consider recent discoveries were used by the ancients for the relief of pain during surgical and other procedures. They made decoctions from the leaves, bark and roots of plants and trees, which they drank, inhaled the fumes of or applied locally. In order to produce sufficient insensibility for operative measures very large doses had to be given. As a result patients frequently remained unconscious for hours or slept on to death. When the anesthetic properties of nitrous oxid, ether and chloroform were discovered, these agents rapidly replaced the drugs employed at that time, but it was generally thought necessary or expedient to reinforce them with drugs possessing hypnotic virtues. Morton, for example, gave large doses of opium before administering ether. As the action of anesthetic substances and the technic of their administration became better understood, the practice was quite generally abandoned. In 1900 Schmeiderin directed attention to the advantages of administering morphin and scopolamin alone or before inhalation anesthesia, and reported the results of this method in ten instances. The sedative and hypnotic effects of scopolamin on the insane is well known and Schmeiderin, an alienist, found that the insane could be more easily managed if given morphin and scopolamin prior to general anesthesia.

The administration of sedative drugs before anesthesia is of great importance and may be considererd from at least three points of view, namely, the patient's, the anesthetist's and the surgeon's. The three alkaloids most commonly employed are morphin, scopolamin and atropin. Before the physiologic action of scopolamin was well understood, Schmeiderin maintained that its action was antagonistic to that of morphin, and, unfortunately, his statements have been rather widely accepted. Hyoscin and scopolamin are now universally recognized by pharmacologists as identical chemically and physiologically. Therefore, the two names will be used interchangeably. Scopolamin and atropin are closely allied alkaloids belonging to the deadly nightshade family. The difference in the structural arrangement of the molecules composing them is believed to explain differences in their action. In order to facilitate a comparative study I have indicated in the accompanying table the actions of morphin, scopolamin and atropin in so far as they are concerned with the subject at hand.

That there are certain advantages in preliminary medication no one of experience will question, but the disadvantages must not be lost sight of. As the comparative safety of ether and chloroform has been settled through a clear understanding of their physiologic action, immediate and remote, so must the advantages and disadvantages of sequence, mixed anesthesias and preliminary medication be settled through a knowledge of the action of the drugs singly and in combination. It is well known that one drug frequently intensifies the action of another and this is especially true of those drugs whose actions are similar. The advantages said to accompany the administration of alkaloids before general anesthesia are as follows:

1. Less of the anesthetic is required. Glandular activity is diminished, thereby reducing the danger of pneumonia. There is less vomiting before and during anesthesia, therefore a smoother narcosis and also less postoperative vomiting.

2. The patient's apprehension of impending danger is lessened or altogether abolished and he enters the anesthetizing room in a quiet, sleepy manner. No resistance is made to preliminary preparation.

3. The stage of excitement is less pronounced and muscular relaxation is more quickly developed.

4. The patient remains asleep after completion of operation, hence suffers less pain. Let us analyze these advantages.

LESS OF THE ANESTHETIC IS REQUIRED

The lessened amount of the anesthetic required is not so important as is generally supposed. It has been conclusively shown experimentally that the degree of concentration of the vapor is of much greater importance than the length of the administration or the amount used. A very concentrated vapor used for a few minutes will do more damage to lung and kidney epithelium than a lesser concentration over a long period. The amount used is always relative. An experienced anesthetist uses much less than a novice. In considering the lessened amount of the anesthetic used the action of the substance which replaces it must be taken into account. That the danger from ether or chloroform is diminished has certainly not been proved. On the contrary, a study of the reports of deaths or other bad results clearly shows that the premedication was actually responsible either indirectly by intensifying the action of the anesthetic or directly through its continued action. There are always symptoms from ether and generally from chloroform which give adequate warning of approaching danger, and both are so evanescent in their action that the patient revives in a comparatively short time when they are discontinued; but, when enduring drugs or combinations of drugs have been previously administered, hours may elapse before the patient is past danger. A review of the literature shows that practically all of the reported deaths were caused by respiratory failure often accompanied by cyanosis and Cheyne-Stokes' respiration, suggesting a paralysis of the centers in the medulla. The conservative surgeon and anesthetist, although they may have seen no deaths or alarming respiratory depressions,

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* Read in the Section on Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

should not pass lightly over the experience of others, but should instead weigh seriously the advantages and disadvantages of a procedure which carries with it additional risk to the patient. Scientific men cannot fail to appreciate the reasonableness of maintaining a factor of safety by protecting the respiratory center and by exercising all possible care in the technic of anesthetization.

GLANDULAR ACTIVITY IS DIMINISHED, THEREBY REDUCING THE DANGER OF PNEUMONIA

Many of the postoperative pneumonias have nothing whatever to do with the anesthetic but are embolic in their origin and occur quite as frequently after local analgesia as after general anesthesia. A pneumonia which develops later than thirty-six hours after anesthesia should not be considered as due to the local action of the inhaled ether. Since the open method of etherization has become so universally employed, the tendency to postoperative pneumonia and nephritis has been materially lessened.

TABLE 1.—THE ACTION OF MORPHIN, SCOPOLAMIN AND ATROPIN

	Morphin*	$C_{17}H_{21}NO_4$, Scopolamin	$C_{17}H_{23}NO_3$, Atropin
Respiration	"Is a powerful [illegible] iratory center." [illegible] ffect is to lessen it [illegible] the rate and depth [illegible]	"Hyoscin is not in any dose a respiratory stimulant and in large doses it is actively depressant to this function."	"Moderate doses stimulate respiration, large doses depress it."
Circulation	"Exerts no direct action on the heart which continues to beat after respiration ceases." "Dilates the vessels of the skin leading to a flushing of the surface, especially the face."	"Small doses raise blood-pressure. Pulse is not ordinarily influenced."	"Increases blood-pressure and greatly accelerates pulse."
Nervous System	"Action is entirely central. Toxic doses produce paralysis of the respiratory center in the medulla."	"Generally depresses the brain producing sleep, but possesses little or no analgesic effects." "Occasionally produces restlessness with hallucinations and delirium."	"Large doses cause restlessness and excitement."
Pupils	"Contracted pupils."	"Dilates the pupil when administered internally or applied locally."	"Pupils dilate on internal administration or local application."
Glandular Activity	"Glandular secretion is less active unless nausea is produced when there is an increase of saliva and perspiration."	"Less glandular activity produces dryness of the mouth, throat and bronchi."	"Diminishes or completely arrests secretion."
Kidneys	"Depresses kidney function."	"Depresses kidney function."	"Depresses kidney function."

*Wood, H. C., Jr.: Pharmacology and Therapeutics, 1912. Stevens: Materia Medica and Therapeutics, 1909. Withaus and Becker: Medical Jurisprudence, Forensic Medicine and Toxicology, iv.

If the head is turned to the side as soon as the neck-muscles are sufficiently relaxed to allow it, and this can be done early in induction, the salivary secretion will escape at the angle of the mouth or remain in the cheek where it can be sponged out. This position has the further advantage of preventing the tongue from falling back in the pharynx and obstructing respiration. That the aspiration of mucus ever produces pneumonia is a doubtful possibility. If ether actually predisposes to pneumonia it does so by its direct action on the lung epithelium, and it is just as reasonable to presume that the checked secretion would render the unprotected cells more susceptible to irritation. Only rarely does the bronchial secretion become sufficient to interfere with blood oxygenation and when it does, the anesthetic may be withdrawn at a time when operative procedures will not be interrupted or interfered with; the mucus acting as a foreign substance will cause coughing when the patient is still asleep and the bronchi will be cleared by a few efforts. The anesthetic can then be continued. This seldom needs to be repeated. Because of the checked glandular secretions, patients frequently complain of great discomfort before and after anesthesia caused by the dryness of the mouth and throat at a time when water is denied them. Patients should be well protected during artificial sleep to prevent as far as possible loss of body heat. A similar statement applies during conveyance from operating-rooms through draughty halls and elevator shafts when resistance is low.

LESS VOMITING BEFORE AND DURING ANESTHESIA; THEREFORE A SMOOTHER NARCOSIS AND ALSO LESS POSTOPERATIVE VOMITING

There will be no vomiting during the induction of narcosis if the patient has been properly prepared. Vomiting during anesthesia always indicates a light uneven narcosis; in other words, with proper technic an absolutely smooth anesthesia is obtained without preliminary medication. The degree of narcosis must fit the operation and the character of the tissues being dealt with. The physician anesthetist, being familiar with the operative procedures, will anticipate the steps of the operation by keeping in touch with the operator and will produce a deeper narcosis when indicated. For example, after the clamps are placed in stomach and intestinal work only sufficient anesthetic is required to prevent vomiting, as there is little sensation in those structures. This is also true in thyroidectomies after the skin incision; little anesthetic is necessary until the skin sutures are being placed; then a deeper narcosis is essential lest the patient move and interfere with this step of the operation.

That postoperative nausea and emesis are lessened is questionable. That vomiting may be delayed is quite understandable from the continued action of the morphin and scopolamin. Patients feel nauseated or begin to vomit several hours after their return to bed or at a time when they should and probably would be over it if the nausea were due to the anesthetic.

APPREHENSION OF IMPENDING DANGER LESSENED

In lieu of the stupefying effects of morphin and scopolamin for producing a peaceful mental state we propose cheerful kindness, tactful sympathy, suggestions as to hoped for improvement or restoration to health, all of which will do much toward quieting a nervous patient. Excitement and haste should never be apparent; likewise, joking or other forms of hilarity in the anesthetizing room frequently impresses the nervous patient with fear that he is not receiving the close attention that the situation demands. A calm, courteous, masterful personality is a desirable requisite in an anesthetist as it does much toward inspiring confidence, and with confidence comes a sense of security and quiet. Final preparation of the field of operation during induction of narcosis not only shortens the anesthesia but helps to divert the patient's mind from the anesthetic.

STAGE OF EXCITEMENT LESS PRONOUNCED

When the technic of the induction stage is properly carried out the so-called "stage of excitement" is either absent or so slight as to be scarcely noticeable except in alcoholics. If patients of the latter class are arranged on the table with restraint straps so that they can be controlled, stimulation passes off in a few minutes. The development of muscular relaxation is only a matter of a little more time.

If an opiate is required for the relief of pain it can be administered when the patient is sufficiently awake to complain. Then one can be guided by conditions as to indications and contra-indications for its administration. Following nitrous oxid, it can be given at the completion of the operation while the patient is still on the operating-table.

Disadvantages of preliminary medication to general anesthesia may be summarized as follows: 1. Danger of respiratory paralysis. 2. Destruction of pupillary reaction. 3. Varying effects of the drugs. 4. Necessity of having a trained, experienced anesthetist in charge of the administration. 5. Predisposition to pneumonia in mouth, jaw and throat operations. Necessity for constant attendance until awake. After-effects as vomiting, headache and a blocking up of secretions. Prolonged respiratory depression which may favor pulmonary edema.

Let us now consider these disadvantages.

DANGER OF RESPIRATORY PARALYSIS

When machines are designed calculations are made to determine the points on which greatest stress will fall and an effort is made to strengthen or fortify these points, in order to provide for contingencies that may arise. In the case of anesthesia the respiratory center is the specially vulnerable point, and every hypnotic drug administered increases the burden which it is called on to bear; therefore, when we employ narcotic drugs before general anesthesia we display poorer judgment in our anesthetic technic than does the designer of machines. "Any dose of morphin that produces systemic effects depresses respiration. Hyoscin is not in any dose a respiratory stimulant and in large doses is actively depressant to this function" (Wood). The combined action of these two drugs is much greater than the sum of their separate action. In other words it is an example of the well-known therapeutic observation that one drug may intensify or augment the action of another, and this is especially true in a scopolamin, morphin, ether or chloroform combination. A much smaller quantity of chloroform or ether will paralyze the respiratory center if it is already depressed by morphin and scopolamin, and therein lies the danger.

Comparatively speaking, a patient may be fairly safe if an experienced anesthetist is in charge, but the method is especially dangerous if an untrained, inexperienced person is administering the anesthetic, as he may fail to recognize approaching respiratory failure and continue the anesthetic until breathing actually ceases. A review of the literature indicates that such respiratory failure frequently proves fatal, in spite of all efforts at resuscitation.

DESTRUCTION OF PUPILLARY REACTION

I unhesitatingly place next in importance to respiratory depression the destruction of the pupillary reaction. To one who is capable of interpreting properly this reflex, it is of the utmost value. There is nothing else which will denote so absolutely the degree of narcosis, or give more certain warning of approaching danger or indicate it more clearly when it is already present. Eyelid, pharyngeal and corneal reflexes when present simply denote a light anesthesia.[1] The amount of relaxation in the muscles of the neck and jaw, especially the latter, is of considerable value but not always reliable. A change in respiration and circulation occurs just before vomiting takes place and is so similar to the change when too deep a narcosis is present that without the aid of the pupil it is frequently difficult or impossible to tell which it is. The modus operandi called for being different in the two conditions, it is essential to be able to distinguish between them.

VARYING EFFECTS OF THE DRUGS

Because of the varying effects of scopolamin its purity was at first questioned but it is now well known that equal doses taken from the same specimen affect different people variously, or the same person is variously affected at different times. On account of such idiosyncrasies it has been suggested that patients be given trial doses on the day preceding the operation. It is also a wise precaution to inquire regarding the effect of morphin as not infrequently patients know of unusual reactions they are likely to exhibit toward this drug.

A TRAINED ANESTHETIST SHOULD BE IN CHARGE

It is often maintained that untrained persons should not administer anesthetics, to which I most heartily agree, but inasmuch as this is frequently done, the patient should be safeguarded in every possible way. The surgeon may be delayed a few minutes before muscular relaxation develops without preliminary medication, but it may be time or a life saved in the end. If respiratory failure develops when only ether or chloroform has been used, automatic respiration continues when once established, because the introduced poisons are quickly dissipated. But not so when drugs whose actions continue for some time, as morphin and scopolamin, have been administered.

PREDISPOSES TO PNEUMONIA IN OPERATIONS OF MOUTH, JAW AND THROAT

In operations of the mouth, jaw and throat an early awakening is most desirable. Morphin allays the reflex excitability of the air-passages, thus retarding coughing and favoring the retention of aspirated blood or vomitus in the trachea and bronchi, a condition which predisposes to pneumonia. Many people are unable to take morphin even in moderate doses without distress and vomiting and in such patients the disagreeable aftereffects of ether or chloroform would be aggravated. On account of the respiratory failure which may develop after the patient has been returned to bed, constant attendance is necessary for several hours. By checking sweating, it throws a greater strain on the kidneys whose function is already depressed. Allow me to cite from my own experience.

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[1] The touching of the cornea is absolutely unpardonable and is as unscientific as it is unclean. Serious eye-infections frequently follow such uncalled-for practices.

A young woman was given 1/4 grain morphin and 1/150 grain scopolamin followed by a forty-five-minute ether anesthesia, during which time a laparotomy was performed for some pelvic trouble. The patient was returned to bed in fair condition. Nearly two hours later respiratory failure developed and she was revived by artificial respiration. About an hour later respiration again failed and artificial respiration was required a second time after which, although the respiration was shallow for a time, it regained its normal depth and frequency.

A similar experience was furnished by a robust man in middle life who was being operated on for fracture of the inferior maxilla.

The patient had been given 1/6 grain morphin and 1/100 grain atropin. The anesthetist was a trained, careful, observing man who assured me he had given a very small amount of ether. Respiration failed early in the operation and was with difficulty reestablished. The operation was continued and, when the patient complained, ether was given but respiration soon failed again. I was called from an adjoining room and we succeeded in establishing automatic respiration after some time and much anxiety. The operation was completed without further anesthetic. Although respiration was superficial and slow it did not cease again, but it was three hours before consciousness returned. There can be no possible doubt as to the cause of respiratory failure in either of these cases, for if it had been due to the ether, automatic breathing would have continued when *once* established by artificial means as there was no obstruction to the entry or exit of air.

Another experience, unfortunately, did not terminate so favorably.

A woman, aged 36, suffering with exophthalmic goiter was given 1/6 grain morphin. An hour later a light ether narcosis was produced and the right superior thyroid vessels ligated and the left vessels exposed ready for ligation, when respiration, which had been shallow, ceased. All effort at resuscitation proved futile.

It is true that the woman was an exceedingly "bad surgical risk" but I am satisfied that I have anesthetized many equally bad with no adverse results. There have been several other instances in my work in which alarming depressions or Cheyne-Stokes' respiration occurred without the development of paralysis which was probably due to an early withdrawal of the anesthetic. A familiarity with the literature shows me that my experience is in no way unique, as there are many reports, not only of temporary respiratory failures, but of deaths during narcosis and after patients have been returned to bed. Persons who were formerly enthusiastic supporters of the practice of administering alkaloids before general anesthesia have either abandoned it entirely or use it only in selected cases and give very small doses. Standing orders for the same fixed dose for every patient without regard for age, condition or operation are certainly not to be recommended.

The selection and administration of anesthetics should be placed on the same sound, scientific basis as asepsis or the practice of surgery. Competent anesthetists, like competent surgeons, are not agreed on all subjects, but we are coming to a better understanding of the physiology of anesthesia, and now that this very important branch of medicine is receiving a much-needed review, we may hope for better anesthetists and better anesthesias. I trust the time is not far distant when the study of anesthetics will be made an obligatory part of the curriculum of every medical college. Surgeons who work with regularly qualified anesthetists should consult with them regarding the selection of the anesthetic and the best method of administration, especially in the so-called "surgical risks." As the anesthetist is responsible for that part of the work, he should be allowed the privilege of giving or withholding alkaloids before anesthesia. The surgeon may be likened to the captain, the anesthetist to the pilot and the patient to the ship. The captain must of necessity depend on the pilot to steer the ship into and through the darkness of oblivion back to the light of consciousness. It is the pilot who, seeing the shoals and sandbars and realizing how near they are to disaster, questions the chosen course. The experienced pilot is much better able to cope with the situation than the inexperienced and yet he, too, although seeing danger ahead, may not be able to escape because the undercurrent, which is the method of anesthesia employed, is beyond his control.

INDICATIONS AND CONTRA-INDICATIONS

Indication: Local analgesia.

Contra-indications: Morphin and scopolamin are contra-indicated, in the case of patients in whom the respiratory center is depressed or likely to become depressed through operative procedures, obstructive dyspnea due to growth within or without the trachea causing pressure, or exophthalmic goiter; in operations about the mouth or throat; in the case of debilitated and cachectic persons or those suffering with continued sepsis; in patients presenting any degree of stupor or those susceptible to morphin, in children and elderly people, and when untrained, inexperienced anesthetists are administering the anesthetic.

CONCLUSIONS

1. The administration of morphin, scopolamin and atropin before general anesthesia has certain advantages but these advantages are not sufficient to counterbalance the risks attendant on their employment.
2. The loss of the pupillary reflex is a serious handicap, as nothing else indicates so unerringly the degree of narcosis.
3. That the danger from ether, chloroform or nitrous oxid is diminished is contrary to the evidence at hand.
4. They should not be employed when untrained, inexperienced anesthetists are in charge, as the anesthetic is rendered more complicated and extra skill and judgment are required.
5. The routine use of certain fixed doses before every anesthetic regardless of the patient's condition should be discouraged.
6. The employment of alkaloids has a distinct field of usefulness before local analgesia.

5740 Jackson Avenue.

An Essential to the Success of Vaccine Treatment.—When the infection has been ascertained the question of a vaccine comes to the front. Vaccination is good when done under proper circumstances and preceded by a correct *clinical* diagnosis. Without a clinical diagnosis vaccination is mere scientific quackery. Good results are not likely to ensue when a pyosalpinx has been overlooked or an appendix full of pus.—*Clin. Jour.*

NITROUS OXID AND OXYGEN ANESTHESIA *

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Dr. Teter, Miss Hodgins and Miss Toot of Cleveland and Dr. McKesson of Toledo have administered nitrous oxid for surgical purposes over twenty thousand times without a death from anesthesia.

In the hands of the expert nitrous oxid is perhaps the safest known anesthetic, while it is perhaps the least safe in the hands of the inexpert. In equally expert hands ether may rival nitrous oxid as to immediate mortality, but ether is wholly outclassed by nitrous oxid as to the indirect postoperative morbidity and mortality. This striking difference is wholly beyond the control of the anesthetist because it rests on a chemical basis. The chemical reactions which favor nitrous oxid anesthesia and handicap ether anesthesia are the following: Nitrous oxid produces anesthesia by reason of its interference with the use of oxygen by the brain-cells; it apparently exerts no other influence except this oxygen interference; therefore its total effect on the body continues but a few minutes beyond the termination of its administration.

Ether, on the other hand, produces anesthesia by dissolving the lipoids of the brain; in addition, unfortunately, ether dissolves many other important lipoids in vitally important structures, such as the lecithin in the red corpuscles—it even breaks up this important structure, as is evidenced by the appearance of hemoglobin in urine, and by a postanesthetic anemia; ether also dissolves the specialized fats in the kidney, the liver and other organs, and, perhaps most unfortunate of all, the lipoids in the phagocytes. Hence it is that ether puts to sleep not only the patient but also the host of defenders, the phagocytes. The result of this is seen in the strikingly adverse effect sometimes following ether anesthesia in the presence of acute infections. These adverse ether effects are especially striking when compared with the effects of nitrous oxid.

Lung complications following nitrous oxid anesthesia are no more frequent than they are in normal persons who have received no anesthetic. I have never known a fatal postanesthetic pneumonia following nitrous oxid. Nitrous oxid plays a passive rôle so far as causing or increasing an existing nephritis is concerned, so that we no longer see postoperative suppression in elderly subjects following anesthesia. As a general anesthetic for diabetics, nitrous oxid is without question the anesthetic of choice. These patients apparently take it with no harmful results whatever, and up to the present I have neither seen nor heard of any deleterious effects following its administration for seventeen amputations in diabetic gangrene.

In comparing ether with nitrous-oxid anesthesia we may say that the dangers and difficulties of nitrous-oxid administration are technical and controllable, while those of ether are inherently chemical and uncontrollable. What, then, are the principal points in the technical control of nitrous oxid? First of all, the induction of anesthesia should be so gradual and careful that never for a moment is there cyanosis and never any muscular twitching on the way to complete unconsciousness. Nor is this all. After superficial unconsciousness is reached, the finesse is continued until regular rhythmic respirations are established and the stage of surgical anesthesia for nitrous oxid is reached.

This is not so deep as that for ether. The patient will "feel" the surgeon's instruments far more readily than under ether, which is a great advantage to the cautious surgeon as it warns him against needless roughness. Under certain circumstances nitrous oxid should be supplemented by ether, for instance, in the case of topers, patients under high nervous tension, and certain abdominal operations in which mass-traction in dislodging tumors must be made; under these or any other circumstances, pink nitrous-oxid anesthesia, if not adequate, is supplemented by ether. I am not an advocate of nitrous oxid alone, or of ether alone, but of good anesthesia.

Muscle tone is not so completely abolished as under chloroform or ether, because under nitrous oxid, surgical anesthesia is much nearer consciousness. Patients who go to the operating-room in fear show this much more markedly than do tranquil patients; in other words, the former are fighting subconsciously during the anesthesia. In order to overcome this factor by dulling their keener perceptions and rendering them oblivious to their surroundings, patients, excepting the very young, the old and the feeble, are given preliminary hypodermic injections of morphin and scopolamin from one and a half to two hours before being taken to the operating-room, so that by this means a large percentage of them retain no unpleasant memory of either going to or coming from the operating-room.

Muscle rigidity under nitrous oxid was formerly a handicap. Crile has now solved this problem so completely that, by following his method it is necessary to use abdominal tapes to hold the viscera out of the operative field in exceptional cases only.

The first factor in obtaining complete relaxation is to have the patient brought to the operating-room in a neutral state mentally, so far as any fear of the operative procedure is concerned. This is accomplished by the preliminary hypodermic. Then the muscular system lacks the tone that we see in preparation for a fight or flight with the accompanying fear. Having no mental anxiety, the patient falls to sleep under nitrous oxid as naturally as though at home in bed. Compare with their condition the state of the patient who is brought to the operating-room in mortal fear. Even when unconscious every muscle is tense, pupils are dilated, respiration is increased and labored, and pulse-rate accelerated. This state is prone to continue during the whole anesthesia.

The second factor in muscle rigidity is tissue-trauma during the operation. Every surgeon has seen muscles increase in tone and contract while they are being cut, and has noted how a lightly anesthetized patient strains while he is attempting to pack off the intestines. When the abdominal wall is being cut through the same reflex is involved as when one is expecting an abdominal blow and hardens his muscles as a protective measure. This persists, even while the patient is unconscious, as a reflex reaction to trauma. This factor is present under any general anesthetic up to that point at which muscle-tone is abolished by the depth of anesthesia. The factor of tissue-trauma may be disposed of by blocking the entire operative field with 1:400 novocain solution. The block, however, must be absolute, for if any impulses get through, the muscles at once increase in tone with the resulting rigidity. Technically this procedure demands considerable practice before the operator is able to open an abdomen and keep it flaccid like the open abdomen of a recent cadaver.

This practice of locally blocking the operative field is far-reaching in its influence. When one is manipulat-

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* Read in the Section on Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis. June, 1913.

ing an unblocked sensitive tissue, the immediate change in respiration and the restlessness of the lightly anesthetized patient teach him manual gentleness and precision, so that he comes ultimately to work as it were with "the velvet hand." This gentleness in turn permits the more kindly healing of wounds because there is less tissue-repair necessary. At the same time the patient's postoperative discomfort is lessened so much that the majority of patients are surprised at their ease and the shortened period of convalescence. Then in addition manual gentleness creates a feeling of sympathy between operator and anesthetist so that they come to play into each other's hands for the mutual benefit of the patient—the surgeon realizes that not a few anesthetic difficulties have their origin in the manipulations and so gives the anesthetist time to deepen the narcosis before completing his own procedure.

Only from one-half to two-thirds the usual amount of inhalation anesthetic is needed when the operation is done under complete anoci-association.

Nitrous oxid meets a need that no other form of narcosis meets: the patients who are most gravely ill take it best and are not in the least harmed by the procedure. Patients experience none of the disagreeable smothering sensation associated with the inhalation of ether vapor, but have merely the feeling of sailing away through the air and notice no disagreeable taste or smell, for the gas is nearly odorless. On regaining consciousness the patient has only one-third the nausea associated with ether, though occasionally there may be morphin nausea.

If we profit by Crile's suggestion in anesthetizing children, we are able to spare them a terrifying ordeal. The principle depends on a primitive instinct which prompts one to combat any condition which tends to curtail free respiratory exchange—in other words, to fight against asphyxia; so that if instead of placing a mask over a child's face one gives him the free end of the gas-tube to play with while the nitrous oxid is flowing, directing it in the meantime toward his nose, he will shortly become sleepy and doze off, when the mask may be applied without any protest.

There is less shock under nitrous oxid than under any other anesthetic. Shock cannot develop unless the nerve-cells have an ample supply of usable oxygen. In the production of shock, the latent energy of the central nervous system is changed to kinetic energy; that is, oxidation of the chromatin in the nerve cells is produced as a reaction to the incoming traumatic stimuli, and manifests itself in nerve impulses. Provided the stimuli from the periphery are sufficiently severe and long-continued, the central nervous system exhausts itself. Now the underlying principle of nitrous-oxid anesthesia is that it curtails the intracellular ability to use oxygen so that *a priori* one expects that shock would be much less marked under it than under any other which does not depend on this principle for its action. Crile and Prendergast have most ably demonstrated this fact in the laboratory and have shown that in animals traumatism under ether will produce twice as much shock as will traumatism under nitrous oxid. The same fact is seen clinically in our grave traumatic cases. In such, having in view the amelioration of the shock already present, nitrous oxid is the anesthetic of choice. Shock arising from our own operative procedure we never see, on account of the strict avoidance of the factors which are causative in its production.

The object of a surgical operation is not only to cure the disease but also to return the patient in the best physical condition and in the least time to his position in society, subjecting him in the meantime to the least possible danger. I think that nitrous-oxid anesthesia when used in connection with local blocking of the operative field, best furthers these aims. Technically this form of anesthesia is more difficult and exacting for the surgeon, yet I feel that we are amply repaid in sacrificing our convenience for the best interests of the patient because, first, our patients have returned to their work in progressively better condition; secondly, our mortality has progressively decreased so that in the last thousand cases in the surgical service at Lakeside Hospital in which anesthesia was given by the anoci method, there was a total mortality of only 0.8 per cent. In fact, the comfort of the patient at large has become such a marked feature of this method that the public with us is coming to demand this dual form of anesthetic.

Osborn Building.

INTRATRACHEAL INSUFFLATION ANESTHESIA (MELTZER-AUER)

REPORT OF A SERIES OF FOUR HUNDRED AND TWELVE CASES [*]

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Meltzer and Auer have shown that continuous insufflation or air into the trachea under moderate pressure is capable of ventilating the pulmonary alveoli, of effecting the necessary exchange of oxygen and carbon dioxid and sustaining life for many hours when all respiratory movements have been abolished by curare.

They have shown that it is the most effective and ideal method of artificial respiration known. It then occurred to them that it might be a means of introducing ether vapor into the respiratory tract, and the extensive and careful series of experiments by which they developed the method of intratracheal insufflation anesthesia are too recent and well known to require review in detail.

This paper will deal simply with personal experience with the method on my service at the Roosevelt Hospital during the past two years in a series of 412 cases, including a great variety of conditions, in many of which we believe it to possess special advantages.

The cases of the series were distributed as follows:

Locations of Operations	No.
Head and neck exclusive of goiter...	77
Goiter and exophthalmic goiter.....	21
Thorax	17
Breast	25
Abdomen	137
Kidney and ureter................	25
Miscellaneous	110
Total	412

There have been no deaths or serious accidents in our series. When the tube is once in the trachea one has ready for instant use the most perfect means now known for the artificial respiration; consequently we have used it by preference in our most difficult and critical cases. We do not use the method to the exclusion of other forms of general anesthesia by any means. Gas and ether, gas and oxygen, drop ether, combined local and general anesthesia and pharyngeal insufflation are employed freely, the attempt being made to fit the anesthetic to the patient and not the reverse, but we do find many conditions in which we believe the intratracheal method to have distinct advantages. During the period in question 2,155 operations have been performed on the second surgical division, less than 20 per cent. of the total under intratracheal anesthesia.

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[*] Read in the Section on Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

Difficulty of intubation is and probably will continue to be the chief obstacle to a more general use of the intratracheal method. The difficulty, however, has been greatly exaggerated; all of our interns acquire the knack very readily and have trouble in only a small percentage of the cases.

In some cases the difficulty is real, for example, in obese patients with short and thick necks, or in those who do not relax readily under the preliminary anesthesia, for good relaxation is essential to easy intubation.

Sometimes the anesthetist will fail after several attempts, the tube entering the esophagus each time, causing irritating delay and prolongation of the preliminary anesthesia. When this occurs after two or three attempts it is our custom to have another man try, and often, although no more skilful, he will succeed at once as the first man, having once lost the way, is apt to repeat his mistake.

We have tried the Boothby-Cotton curved guide and other devices for intubating by the sense of touch, but prefer and use almost exclusively the Jackson direct-vision laryngoscope.

The anesthesia is essentially light, and in a few alcoholics and robust adults we have had difficulty in securing quiet anesthesia and good relaxation. The use of a preliminary hypodermic of morphin and atropin in such cases generally obviates this trouble, and in no instance during the past year have we had to abandon the method on this account.

SAFETY OF THE METHOD

With a suitable apparatus (many such have been devised, some simple, some very elaborate) we believe that the method is absolutely safe if certain cardinal principles of technic are understood and carefully observed:

1. Intubation should be done by direct vision, or, if by touch, with the utmost care to avoid trauma to the larynx or trachea.

2. The tube must not be too large, its diameter not more than half that of the glottis; 24 F. should be the maximum for the average adult, ranging down to 18 F. or even smaller according to the size of the larynx and of the patient.

3. The tube must not be inserted farther than 26 cm. from the incisor teeth; that is, its tip should be at least from 1 to 2 inches above the bifurcation of the trachea. A tube pushed on down into a bronchus and plugging it might cause serious mischief.

4. Overpressure must be carefully guarded against, best by a suitable safety-valve attached to the apparatus. The average pressure used is from 18 to 25 mm. of mercury; from 35 to 40 mm. is a safe maximum. If from a defect in the apparatus or from any reason the pressure is not known and under absolute control, the insufflation should be discontinued at once.

5. If the tube enters the esophagus by mistake, it should be disconnected and pressure made on the epigastrium to deflate the stomach before it is withdrawn and replaced in the trachea. We have had this happen a number of times, but have never seen any untoward results.

6. The ether vapor should be of moderate concentration, and must be absolutely free from droplets or spray of liquid ether. The apparatus devised by Dr. Karl Connell, assistant surgeon to the Roosevelt Hospital, has enabled us to make accurate observations as to the strength of ether required. The maximum strength used for maintaining anesthesia is 21 per cent. by weight, and this is graded down to about 14 per cent. as the operation proceeds. We have had no experience with higher degrees of concentration, but would fear possible pulmonary irritation.

SHOCK

We are convinced that shock is noticeably less with insufflation than with other methods of etherization, and believe that it is largely due to the complete relief of respiratory strain and the abundance of air continually present and rapidly renewed in the pulmonary alveoli. Dr. Meltzer has aptly referred to it as a luxury of respiration. The even delivery of well-diluted ether vapor and the accurate control of its strength is probably also a factor. The coincident relief of strain on the circulation is especially striking in operations for exophthalmic goiter and in severe and prolonged operations of various kinds, especially in anemic or debilitated patients.

Since we have used insufflation anesthesia in our most serious cases, we have rarely needed the intravenous saline infusions which we use during or at the termination of the operation, if the pulse shows signs of weakness or there is a marked fall in blood-pressure. This is not because we have lost faith in the saline, nor yet because the type of cases has changed; but I believe that fewer cases show evidence of shock since insufflation has been used in just the class of cases that formerly called for stimulation.

The relief of strain on respiration and circulation necessarily means a similar effect on the central nervous system, and this is shown in the absence of postoperative depression and the rapid recovery from the effects of the anesthetic and the operation.

PNEUMONIA

Experimental and clinical evidence has shown conclusively that neither pneumonia nor bronchial irritation is caused by insufflation anesthesia. Our experience coincides with this view, for while there have been in our series six cases of postoperative pulmonary complications, three only could be considered as possible ether pneumonias, and in none of these do we believe that the insufflation was responsible *per se*. It will bear repetition in relation to this point that the cases of this series have included the most difficult and serious of a busy service in the heart of a great city, on which is thrown a large number of desperately ill patients.

As this question is of vital importance in judging the method, brief notes of these cases are given.

We believe that insufflation not only does not cause bronchial irritation or pneumonia, but that it acts as a preventive, first, in bad breathers who are more or less insufficiently oxygenated and under respiratory strain, and who are continually aspirating mucus and saliva, and, secondly, in operations about the mouth and pharynx, by preventing aspiration of blood and detritus. This is of the greatest benefit in excisions of the tongue or jaw and various operations of the mouth, nose and pharynx. Such operations are greatly simplified by the use of the method, and the necessity of ever having to resort to a preliminary tracheotomy is practically eliminated. In this respect pharyngeal insufflation cannot take the place of the intratracheal method.

Of the six cases of pulmonary complications, two have already been reported.[1]

The other four cases are briefly as follows:

CASE 1.—M. G., man aged 45 years, was operated on Oct. 12, 1912, for acute septic cholecystitis with extensive localized peritonitis and perihepatitis. Cholecystostomy was performed with prolonged drainage of gall-bladder and suppuration of wound. The abdominal wound broke open on the twelfth day. Right lower lobe pneumonia developed on the second day, signs persisting about five days. The patient recovered. While the pneumonia was in all probability a complication of the disease and not due to the anesthesia, ether pneumonia cannot be excluded.

CASE 2.—J. A., woman aged 25 years, Syrian, operated on Nov. 15, 1912, for tuberculosis of rib and thoracic wall, was emaciated and showed signs of pulmonary tuberculosis. Right lower lobe pneumonia developed twenty-four hours after operation; later the upper lobe was involved; there were defervescence and recovery after a sharp course of eight days. This was a case in which the administration of ether in any form was an error; the pneumonia was as likely due to the preliminary anesthesia as to the insufflation.

CASE 3.—G. B., man aged 64 years, was operated on Dec. 7, 1912, for extensive indurated mass in pyloric region of stomach, probably carcinomatous and ulcerated. A palliative gastro-enterostomy was done. There were signs of consolidation in the right lower lobe, first detected six days after operation. Death occurred from pulmonary abscess with surrounding zone of consolidation twenty days after operation. This case requires no comment as it was evidently a complication of the disease and not due to the anesthesia.

CASE 4.—P. G., man aged 35 years, was operated on Jan. 16, 1913, for obscure abdominal symptoms. A malformation of liver (diminutive right lobe), great hypertrophy of omentum, and chronic appendicitis were found; there was a good deal of manipulation in the region of the liver during exploration. The preliminary anesthesia in this case was unduly long and deep, lasting thirty minutes. The intubation was accomplished only after repeated trials; the anesthetist was a beginner. Right lower lobe pneumonia developed promptly, subsided after five days and the patient made a good recovery. The preliminary anesthesia in this instance was unquestionably responsible for the pneumonia.

We have had no laryngitis or loss of phonation; when it occurs it is probably due to the use of too large a tube or to trauma in intubating.

Sore throat with pain on swallowing lasting a few days has occurred in a number of cases, due always to direct trauma to the pharynx in intubating.

Vomiting is less than in ordinary etherization, and seems to depend largely on the length and degree of preliminary anesthesia required to produce sufficient relaxation for intubation, or on the nature of the illness itself.

In 141 insufflations observed since January 1 by our present intern anesthetist, Dr. White, thirty-two patients vomited once (22.7 per cent.), twenty-four vomited twice (17 per cent.), and six vomited several times (4.2 per cent.), a total of sixty-two (43.9 per cent.).

For positive pressure in thoracic operations it is fast supplanting other more cumbersome methods, as, in addition to the facility with which the degree of pressure can be controlled, the automatic ventilation of the lungs is of the greatest advantage. The far-reaching influence which intratracheal insufflation will have on the development of thoracic surgery in the near future is scarcely appreciated as yet. Heart and great vessels, lungs, bronchi and intrathoracic esophagus, are accessible and approached with increasing safety.

CONCLUSIONS

1. Intratracheal insufflation, administered with accurate control of the strength and amount of ether vapor, is a new principle in anesthesia which in certain classes of cases has many advantages over other methods.

2. The difficulty of intubating and the necessity of inducing full surgical anesthesia before this can be accomplished makes this a method unsuitable for many short, simple operations. Its use should be restricted to the cases in which it has special advantages.

3. It is absolutely safe both as to administration and freedom from deleterious after-effects if a proper apparatus is used and the simple precautions mentioned in detail are observed.

4. It is an ideal method of differential pressure for operations involving the opening of one or both pleural cavities, greatly reducing the danger of intrathoracic operations.

5. It greatly lessens operative shock: (*a*) through the absolute relief of strain on the respiratory apparatus and coincident freedom from strain on the circulatory apparatus and the central nervous system, and (*b*) from the even, advantageous degree of anesthesia maintained. This is especially evident in aged patients, in those cachectic from malignant disease or anemia and debilitated from other causes. The disparagement of ether as an anesthetic as compared to nitrous oxid, so popular of late among the advocates of the latter, is based on observations of faulty methods of ether administration rather than the inherent toxic effect of the drug itself. The wide margin of safety with ether has so long permitted abuse with this drug that faulty technic has been assumed by its opponents as customary in its administration.

6. It prevents aspiration of mucus or saliva, vomitus, blood or other foreign matter into the trachea, simplifying and decreasing the danger of operations on the tongue, jaws, mouth, nose or pharynx, preventing aspiration pneumonia, and practically eliminating the necessity of preliminary tracheotomy in such cases.

7. It is especially useful in operations about the head and neck. The anesthetist is out of the way; the operative field is easily kept sterile and obstruction of the upper air-passages is absolutely prevented. The same may be said of operations on the kidney, the spine and in awkward positions in general.

8. The degree of anesthesia is under perfect control. Overetherization is impossible at or below 21 per cent. by weight of ether vapor. Insufflation of pure air for the last few moments of the operation hastens the recovery of consciousness and minimizes the after-effects.

30 West Fiftieth Street.

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[1] Peck, Charles H.: Intratracheal Insufflation Anesthesia, Ann. Surg., July, 1912, p. 193.

Fly-Borne Typhoid.—C. E. Terry in the *U. S. Public Health Reports*, gives an account of the control of typhoid in Jacksonville, Fla., showing a marked reduction in the typhoid rate since the enforcement of rules requiring the fly-proofing of privies, the screening of sick-rooms in cases of typhoid, and the destruction of flies by poison or sticky fly-paper. He believes that the fly transmits infection through its excreta rather than by means of the specific bacilli carried on its feet from infectious material; also, that the fly bred in infectious material is a carrier for a longer period and hence more dangerous than the insect obtaining its infection through contact or feeding after maturity.

LOCAL ANESTHESIA *

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In 1907 at the meeting of the American Medical Association at Atlantic City, I presented a paper on local anesthesia and in the following year a report through the anesthesia commission on the extent to which it was used in this country. Since that time there have been important developments; the field has been broadened and the popularity of the method has increased both at home and abroad. It has seemed that a general review of this development might be of interest.

Probably the one greatest factor has been the introduction of novocain as a substitute for cocain. First clinically tested by Heinrich Braun in 1905 and extolled by him in several papers,[1] it has been generally adopted and is now recognized as the best and safest substance for the production of local anesthesia. It has the great advantage of being about seven times less toxic than cocain, and its solutions stand boiling. It is conveniently supplied in tablet form in combination with synthetic suprarenin. In preparing solutions these tablets are dissolved in 0.6 per cent. salt solution to which is added a little hydrochloric acid. For infiltration purposes 0.25 to 0.5 per cent. solutions are used and as much as 125 c.c. of the latter strength may be injected with perfect safety. Braun states that he has repeatedly used as much as 250 c.c. (1.25 gms.) of this strength and has never seen trouble therefrom, but cautions that we should in spite of this ever bear in mind that novocain is a poison. We can therefore infiltrate very extensively with no fear of toxic effect, a fact which accounts in large part for the extension of local methods into new fields.

Anesthesia is probably obtained somewhat more quickly with cocain and where small amounts only are necessary I still use it; but, for all larger infiltrations, novocain is the choice.

Urea and quinin hydrochlorid, suggested by Thibault and popularized by Hertzler[2] and others, is another anesthetizing agent which has proved of value. It has in its favor practically negative toxicity, its control of postoperative bleeding and the fact that anesthesia obtained by it may last for several hours or days, thus eliminating postoperative pain. It is thus well fitted for rectal work and is said to be especially useful in the removal of tonsils. The ordinary strength of the infiltration solution is from 0.5 to 1 per cent. Anesthesia is obtained slowly and one should wait at least fifteen or twenty minutes after the injection before beginning an operation.

In 1908 Bier[3] presented an entirely new method of obtaining anesthesia of the limbs through the medium of intravenous injection of novocain. The limb is rendered perfectly ischemic by the application of a rubber bandage from the periphery to a little above the point at which a vein is to be exposed. At the central edge of this expulsion bandage an Esmarch tourniquet is tightly placed over a broad surface. The expulsion bandage is removed and a handbreadth or so below the first tourniquet a second is applied. Between these two a vein is exposed, usually the internal saphenous in the leg and the cephalic, median or basilic in the arm. The vein is ligated centrally and a cannula introduced distally and tied in place. Novocain (0.5 per cent.) is then forced into the vein under considerable pressure—from 60 to 100 c.c. in the leg, 40 to 70 c.c. in the arm—the cannula is removed and the vein tied. In one or two minutes there is complete anesthesia in the area between the tourniquets—direct anesthesia—and in ten or fifteen minutes in the parts distal to the second tourniquet—indirect anesthesia. There is also complete motor paralysis; so that there is obtained as thorough relaxation as under general narcosis, rendering this method applicable for any operative procedure. The anesthesia persists as long as the central tourniquet is left in place and disappears quickly after its removal. Bier's longest operation lasted one and three-quarter hours. Hayward[4] in November, 1912, reports from Bier's clinic 375 operations under vein anesthesia; including amputations, joint resections, fixation of fractures, tendon transplantations, removal of varicose veins, etc. There was complete anesthesia in 93 per cent. and in only 3 per cent. was narcosis necessary. There were no accidents or bad results. Kaerger[5] from the same clinic reports 150 further cases and gives the details of the method as applied to minor operations on the hand and foot, a most useful procedure in office or dispensary work.

Undoubtedly venous anesthesia furnishes us a useful addition to our means of carrying out operations in non-septic conditions of the extremities, but the discomfort of the tourniquet is often a factor which must be considered.

Goyanes[6] in 1909 suggested a similar procedure except that he injected the anesthetic by means of a fine needle directly into an exposed artery. Ransohoff[7] in 1909-10 used a similar method, but did not exsanguinate before injecting. The intra-arterial method seems to show no advantages over the venous and has the disadvantage that arteries are more difficult of access than superficial veins.

A knowledge of sensory nerve-distribution renders easy the anesthetization of distal portions of an arm or leg by perineural or endoneural injection. Crile[8] in 1902 injected the several cords of the brachial plexus after exposing them. Hirschel[9] first obtained anesthesia of the whole arm by injecting the plexus in the axilla without incising the skin and Kulenkampff,[10] stimulated by his paper, has worked out a method by which he reaches the plexus above the clavicle. He gives anatomic details and reports twenty-five cases, in fifteen of which total anesthesia was obtained and in only three of which a little ether was needed.

For the leg Läwen[11] in 1911 presented the technic of reaching through skin punctures the various nerves so as to anesthetize the whole limb and in 1912 Keppler[12] published an extensive article with further details and

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* Read in the Section on Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

[1] Braun: Deutsch. med. Wchnschr., 1905, xxxi, 1667; Deutsch. Ztschr. f. Chir., 1911, iii, 321; Lokalanesthesie, Edition 3, 1913.

[2] Hertzler, A. E., Brewster, Roger B., and Rogers, Ford B.: Quinin and Urea Hydrochlorid as a Local Anesthetic, THE JOURNAL A. M. A., Oct. 23, 1909, p. 1393.

[3] Bier: Arch. f. klin. Chir., 1908, lxxxvi, 1007.

[12] Keppler: Arch. f. Chir., 1912, c, 501.

[4] Hayward: Arch. f. klin. Chir., 1912, xcix, 993.

[5] Kaerger: Arch. f. klin. Chir., 1912, xcix, 983.

[6] Goyanes: Rev. clin. de Madrid, 1909, i, 12; Zentralbl. f. Chir., 1909, xxxvi, 791; Zentralbl. f. Chir., 1911, xxxviii, 1600.

[7] Ransohoff, J. L.: New Method for Inducing Local Anesthesia, Lancet-Clinic, Aug. 7, 1909; abstr., THE JOURNAL A. M. A., 1909, p. 741; Ann. Surg., 1910, li, 453.

[8] Crile, G. W.: An Experimental and Clinical Research into Cocain and Eucain, THE JOURNAL A. M. A., Feb. 22, 1902, p. 491; The Results of Operations, Especially Abdominal, Performed on the Principle of Anoci-Association, ibid., July 13, 1912, p. 114.

[9] Hirschel: München. med. Wchnschr., 1912, lix, 1218.

[10] Kulenkampff: Zentralbl. f. Chir., 1911, xxxviii, 1337.

[11] Läwen: Deutsch. Ztschr. f. Chir., 1911, iii, 252; München. med. Wchnschr., 1911, lviii, 1390.

reports of cases. Babitzki[13] quite recently described a method whereby the sciatic nerve can be reached at the foramen for direct endoneural injection, the needle being introduced through the gluteal muscles and controlled by a finger in the rectum.

Franke and Posner[14] contribute from the Heidelberg clinic in 1912 a study of the sensory nerves of the pelvis and perineum with the technic of reaching them by puncture. They report several perineal prostatectomies and in a footnote ten additional ones, all completed under absolute anesthesia.

Ruge[15] cites numerous vaginal operations and two complete vaginal hysterectomies accomplished painlessly under simple infiltration with novocain, and from Knight Smith[16] comes a report of two successful and painless cesarean sections by the same method. Läwen's method of paravertebral nerve-blocking, reaching the nerves at the spinous processes of the vertebrae, was applied by Finsterer[17] to abdominal work. He obtained perfect anesthesia in four out of six cases and recommends this procedure especially for removal of the appendix. Kappis,[18] applying the same method, has removed the kidney in three cases; Schumacher[19] recites thirty-five thoracoplasties and Heidenhain[20] four laminectomies. Kappis found that absolute anesthesia could thus be obtained for operations on the gall-bladder and stomach. This is of particular interest in showing that the vagus is not concerned with the sensory innervation of this region.

The head has been a special field of investigation. In the papers of Braun, Offerhaus[21] and Härtel,[22] not only are the methods of reaching the individual branches of the fifth nerve accurately mapped out; but even the injection of the gasserian ganglion itself is detailed with mathematical accuracy. All operations in the field of supply of the fifth nerve are done by preference under local anesthesia by these surgeons. Braun states that local anesthesia has made of resection of the upper jaw quite another operation, which may still have its horrors and its difficulties but has quite lost its danger; that patients come through it with absolutely no collapse and quite as fresh as before it began and scarcely need to go to bed. Of ten patients he has lost none and had no pulmonary complications. Härtel reports nine cases in equally glowing terms.

Excision of the tongue or lower jaw comes under the same category. Härtel's brilliant article,[23] published in December, 1912, details the anatomic approach to the gasserian ganglion by needle puncture and its reading would well repay any one interested either in the subject under discussion or the injection treatment of tic douloureux. The ganglion is reached through the foramen ovale and injected with 1 c.c. of 2 per cent. novocain-suprarenin solution. Anesthesia is obtained almost immediately and lasts about an hour and a half. Härtel reports sixteen operations in which he has used this method, in nine of which the ganglion was injected on both sides. The operations included six resections of the upper jaw, three of the lower jaw and two of the tongue. Besides these there were fourteen patients in whom the ganglion was injected with alcohol. In all there were thirty-nine attempts at puncture of the ganglion, of which he reports twenty-eight as easy, seven difficult and four with no anesthesia obtained, so that the ganglion was probably not reached.

The neck had long been a favorite situation for work under local anesthesia and the accomplishments of Bier, Kocher and others are well known. The progress in this field in the last few years is along old lines, but the possibilities have been greatly increased by the introduction of novocain because of the enormous amount of the solution which can be used. Braun reports, that from 1908 to 1911, his 150 thyroidectomies have without exception been done under local anesthesia.

To one accustomed to the use of cocain administered as sparingly as possible, it is surprising how simple and painless these operations become with the generous novocain infiltration as recommended by Braun. The third edition of his book on local anesthesia, just published in the last few weeks, is a storehouse of interesting and wonderful descriptions of the conquest of sensation in all parts of the body. The technic of the injections for various operative procedures is given in detail, illustrated by charts and photographs in such a way as to make a practical working guide.

The work of Crile on shock and anesthesia has been of great value. Showing that shock has as its basis a definite injury to nerve cells, he has sought to lessen this by interrupting the conduction paths between the brain and the field of operation, a principle which he has designated "anoci-association." The three factors concerned are hemorrhage, anesthesia and trauma, of which the latter two are the most difficult to control. The influence of trauma, he finds, can be obliterated by blocking the conduction paths by means of a liberal infiltration with 0.25 per cent. novocain. Bloodgood[24] indorses and confirms Crile's work and urges surgeons to familiarize themselves with the technic by applying it not only to the handicapped patient, to whom it may be the deciding factor of safety, but in daily routine work. He believes this will also add to the comfort of the ordinary individual who can stand considerable operative trauma and bad anesthesia. Bloodgood states that only by the aid of the sphygmomanometer can the surgeon estimate the real significance of the traumatic factor. He finds that there is no change in blood-pressure in operations under local anesthesia so long as no pain is inflicted; and familiarity with recent methods should enable one to obtain a painless operative field in the vast majority of cases. Braun's description of excision of the upper jaw or tongue is a striking example of the protection against shock which local methods afford. As he says, the patients scarcely need to go to bed.

Nowhere is this better exemplified than in surgery of the aged. How many individuals cannot any one of us recall who have been refused the possible benefits of surgery because of age? We can all remember epitheliomas of the lip, in which the lymph-nodes have not been removed, because it was not thought wise to prolong anesthesia; fractures which have been left to vicious or no union; or hernias doomed to the uncertain protection of a truss and the dangers of strangulation. In these cases a mastery of local methods means safety, and by a judicious combination of local anesthesia with a little nitrous oxid at crucial moments the possibilities are without limit.

The removal of cervical lymph-nodes in epithelioma of the lip is so painless as to cause no disturbance whatever. My routine is to infiltrate the neck thoroughly with 0.5 per cent. novocain and then proceed with the excision of the growth on the lip. By the time this is finished and the gloves changed, anesthesia in the neck is so well established that the dissection can be carried out at will. I have done this on a man well along in the eighties and had him walking about next day. In a man of 97 I removed a large epithelioma of the cheek involving the zygoma. This was especially interesting in that a section of Steno's duct was removed and an end-to-end suture made with resulting patency of the duct. The operation lasted nearly two hours and was followed by no shock or depression.

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[13] Babitzki: Zentralbl. f. Chir., 1913, xl, 227.
[14] Franke and Posner: Arch. f. klin. Chir., 1912, xlix, 139.
[15] Ruge: Zentralbl. f. Gynäk., 1912, xxxvi, 561.
[16] Smith: Surg., Gynec. and Obst., 1910, xi, 423.
[17] Finsterer: Zentralbl. f. Chir., 1912, xxxix, 601.
[18] Kappis: Zentralbl. f. Chir., 1912, xxxix, 249.
[19] Schumacher: Zentralbl. f. Chir., 1912, xxxix, 252.
[20] Heidenhain: Zentralbl. f. Chir., 1912, xxxix, 281.
[21] Offerhaus: Arch. f. klin. Chir., 1910, xcii, 1.
[22] Härtel: Verhandl. d. deutsch. Gesellsch. f. Chir., 1911, i, 243.
[23] Härtel: Arch. f. klin. Chir., 1912, c, 193.
[24] Bloodgood: Progr. Med., 1912, iv, No. 4, p. 207.

In the treatment of fractures the combined method has been found most useful. Thus in a feeble old lady of 85 with a long, oblique fracture of the shaft of the left femur with great displacement, I was able to expose the bone under infiltration anesthesia. She was then given a few whiffs of nitrous oxid and the fragments brought into line. During the drilling of the bone and the application of the plate, she was conscious and talking, but felt no pain. She was gotten up in a chair the next day and left the hospital in six weeks walking and without crutches or cane.

In hernia operations, I do not consider old age a contra-indication. Hernias of all varieties, I believe, are best done under local anesthesia; and, except in very young children, I recall no case in which it has been necessary to resort to narcosis in the last few years. My oldest patient, a man of 98 with a strangulated inguinal hernia, was operated on over a year ago, the bowel in good condition. He made a good recovery and is now pursuing his work as an artist. In a woman of 84 with an eight-day strangulated hernia with gangrenous small intestine, a two-stage operation was done. The bowel was first brought out and opened, and on the following day her condition was so good that a resection and Murphy button anastomosis was made. Her recovery was uneventful.

In presenting this review of the literature of the last few years, I have by no means exhausted or done justice to the material, but have tried to give some idea of the general progress. I have endeavored to point out some of the possibilities and to show the degree of perfection which can be obtained by such skilled masters as Braun, Bier, Härtel and others.

In this busy American life of ours, I cannot believe that many of us will ever take the time or have the patience to attain that degree of skill. I hope, however, that some of us may persevere and be rewarded by finding how much ease comes with experience. As Bloodgood states, in speaking of Crile's work, the technic cannot be mastered by restricting its employment to handicapped patients, who are too few to give sufficient experience. The details should be learned by daily experience where absolute success is not so imperative. Above all, I trust the method will not in the future be condemned, as it has been in the past, because of ignorance of its possibilities and inexperience in its application.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. HERB, SLOAN, PECK, MITCHELL AND BOOTHBY

Dr. Carroll W. Allen, New Orleans: As early as 1889 Dr. Matas introduced a method for reaching the second division of the fifth nerve by passing the needle into the orbit, hugging the bone at the lower external angle and directing the needle slightly inward. It enters the sphenomaxillary fissure, passes backward a distance of 5 cm., in the orbit of an adult, and then is exactly under the foramen torundum. I have used this method for blocking the second division of the fifth nerve. I have had ten or twelve cases in which the entire jaw was removed. When the needle is passed 0.25 cm. further back, it reaches the third division of the nerve The methods introduced by Offenhaus and by Härtel exemplify the more notable progress made in this field lately. Härtel produces a small area of anesthesia on the cheek and introduces a needle about 5 cm. in length upward, forward and backward.

Dr. Karl Connell, New York: I believe that the use of alkaloids before anesthesia is entirely unnecessary unless one is using an anesthetic like nitrous oxid. I do not believe that nitrous-oxid-oxygen anesthesia is preferable to ether. The results, so far as Gwathmey and I have gone, show quite the contrary. The ether blocks shock far better than pure nitrous oxid. Intratracheal anesthesia is one of the most highly advanced methods now in use. It causes beautiful oxygenation, carries the patient without shock and permits positive pressure, if desired, and the highest degree of artificial respiration; but the chief advantage in the average case is that it permits one to carry the anesthesia absolutely on the lowest percentage for that particular person and that particular type of operation. As Dr. Boothby said, one can carry along the anesthesia for hours, possibly days. Ether percentage has come to be an important factor in giving an anesthetic, because it is desired not only to put the patient to sleep promptly, but to keep the patient asleep for as long a time as necessary, even hours, with the use of a minimum amount of ether. The level, as it is called, should be maintained in every case. When the operation is completed, the patient should wake up promptly; in fact, he should be practically out of the anesthesia.

Dr. Evarts Graham, Chicago: We have learned that ether is perhaps indirectly responsible for some of the various postoperative or postanesthetic complications with which we are familiar, such as thrombosis, embolism, various lung complications, shock and acute dilatation of the stomach. It should be further desirable to attempt to devise an arrangement by which the ether will maintain its toxic action on the body the shortest possible time. This concerns also the problem of elimination of ether. Even after a short ether anesthesia the smell of ether may be detected in the breath of the patient for a number of hours afterward, so that even under ordinary circumstances ether is slowly eliminated from the body. Now, if we desire to increase the rapidity of elimination of ether from the body, we must consider first of all the channels by which it is normally eliminated. Ether is eliminated in large quantities through the lungs. It also gains entrance to the alimentary tract. The vomitus even after a short anesthesia smells strongly of ether. The ether also escapes through the skin, and part of it gets back into the alimentary tract and is reabsorbed. A period of hours is necessary to eliminate all of the anesthetic from the body. If we can step in somewhere on this circle and drive out the ether in some other way than occurs naturally, we may prevent some of these distressing postoperative complications. The fact that ether is more soluble in fat than it is in water is evidence that such a process can occur; by placing fat in the alimentary tract we can hold the ether there and prevent its absorption from the intestine. If two dogs of the same weight are given through a stomach-tube the same amount of ether, in one case diluted with the same amount of water, and in the other with an emulsion, the dog which receives the ether and water, if it does not vomit up the mixture, becomes deeply anesthetized, often sufficiently to kill it, whereas the dog which receives the mixture of ether and fat not only does not vomit, but is in no wise affected by the ether. This shows conclusively that the fat has prevented the absorption of the ether. Advantage has been taken of this fact in the clinic. For the last year or two I have administered fat in the form of olive oil after the anesthetic was stopped. I found that not only is the postanesthetic period shortened, but there is also less vomiting, in spite of the statements to the contrary which one occasionally finds in the literature, based on mere conjecture and not on experimental proof.

Dr. Harry G. Sloan, Cleveland: The experiments carried out by Crile and *Prendergast* were as follows: Ten dogs were taken in each of two groups. The first ten were given ether, and shock was produced by rubbing the peritoneum for three hours. The second group were given nitrous oxid, and shock was produced in the same manner as in the first group. Blood-pressure tracings were taken to determine the reaction. The ether dogs showed at the end of three hours an average blood-pressure of 10 mm. of mercury, whereas the nitrous oxid dogs showed a pressure of 110 mm. of mercury. Surely a great difference! The ether was given by the open drop-method, not the intratracheal method. I do not see that there is any great difference *in the method of administration*, for anesthesia occurs *only* when the blood-stream contains a certain percentage of ether. In shock, the brain transforms its latent energy into nerve impulse in response to traumatic stimuli; its cells become exhausted. Ether anesthetizes by lipoid solution. Nitrous oxid anesthetizes by inhibiting the intracellular use of oxygen, so that we have two directly contrary principles at work. Under nitrous oxid the functional activity of the nerve-cell is curtailed; hence exhaustion is much more slowly reached than under ether when oxidation is normal.

VACCINE THERAPY FOR GENERAL PRACTITIONERS *

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The first record[1] of induction of active immunity for therapy was about two hundred years ago when it was learned that the orientals were practicing immunization against small-pox by means of inoculation of a little small-pox virus under the skin. From this rather hazardous procedure developed the use of the less dangerous and milder virus of cowpox by Jenner[2] in 1796. The next work of importance was that of Pasteur,[3] who developed a mild and at the same time an immunizing attack of anthrax by inoculating animals with anthrax bacilli which had been grown at a temperature of 43 C. (109.4 F.). Since this advancement many different methods of active immunization have been developed. These methods have been well classified by Bolduan[4] as follows:

1. *Living Cultures of the Virus:* Usually the cultures are attenuated, but there are some exceptions. A number of different methods have been employed for the attenuating of the virus, thus: by drying, as is done with the rabies in the Pasteur[5] treatment; by growing the virus at a temperature that is unsuited to the development of virulence, as is done in the case of anthrax;[3] by passing the virus through a less susceptible animal as is done in small-pox;[2] by means of chemicals such as the addition of iodin to diphtheria toxin, as was formerly done by von Behring;[6] or by means of heat as was formerly done with diphtheria toxin.
2. *Dead Cultures of the Virus:*[7] The cultures can be killed by heat or by the use of chemicals.
3. *The So-Called Combined Method:* This consists of first administering a dose of the specific immune serum and subsequently the virus. This method has been used in typhoid, cholera and plague.
4. *The Products of Autolysis of Cultures:*[8] These have been used in diplococcus meningitis and in typhoid, and seem to possess certain advantages over native cultures.
5. *Combinations of Preceding Methods:*

CHOICE OF METHOD

The choice of the various methods of immunization depends on the nature of the virus, and has been decided for us by research workers from time to time. For small-pox we use with perfect confidence a virus that has been passed through the less susceptible cow and purified. For diphtheria we also use with perfect confidence an immune serum. For typhoid we use dead cultures of typhoid bacteria, and for anthrax we use living cultures of anthrax bacilli grown at a high temperature. The reasons for a choice arise from certain particular facts of immunity, and their discussion is out of place in a paper of this character.

IMMUNITY BY MEANS OF BACTERIA KILLED BY HEAT

The interest in this work has been much stimulated during the last few years by the work of Wright.[9] Indeed, it has been activated to such an extent that many drug firms are marketing preparations of uncertain composition and action.[10] These vaccines are all of the stock variety, and are at best inferior preparations. As a rule the instructions for administration are inaccurate or incomplete. For these reasons much negative harm may be done to the patient by the use of too small a dose, or by use of an improper vaccine. Also much positive harm may accrue from the use of too large a dose.[11] There is surely necessity of using a vaccine that is beyond question one of the highest efficiency, and it is needful to administer such a vaccine in a proper manner. There is no exaggeration in the statement that more painstaking care is required in the management of a vaccine case than is required in the management of a case of broken cardiac compensation. In both cases the amount of the dosage of vaccine in one case, and of digitalis in the other, must be regulated by the clinical effect on the patient, and it is just as impossible to foretell the dose of a vaccine required as it is to foretell the amount of digitalis necessary to act, and not overact, without knowledge of and experience with vaccines.

PREPARATIONS OF VACCINES[12]

The first rule in the preparation of a vaccine is this: An autogenous vaccine is always more desirable than a stock vaccine. A stock vaccine may be of no value whatever in the production of immunity in any given case. Even when a number of different strains are used in the preparation of the vaccine, it is most often markedly inferior to autogenous vaccines. If there were certainty that the infecting organism were of the same strain as the one used in the preparation of the vaccine, then such a stock vaccine would approach the efficiency of the autogenous vaccine. Unfortunately many of the most common bacteria differ in different strains in the production of immunity as much as the bichemical characteristics of bacteria of different species differ. It is always best, therefore, when preparing a vaccine, to use a culture from the disease of the patient himself. If, however, it is impossible to obtain an autogenous growth, the best chance of good results is in the use of a freshly made vaccine from a strain of the causative bacteria, in cases this may be taken for granted as in furunculosis.

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* From the Department of Clinical Pathology, Cornell University Medical College.

[1] Bolduan: Immune Sera, p. 169.

[2] Jenner: An Inquiry into the Cause and Effect of Variola Vaccina, 1796, iv, 75.

[3] Pasteur, Recherches sur l'étiologie et la prophylaxie de la maladie charbonneuse, Rec. de Méd. Vét., 1879, No. 6, vi, 193.

[4] Bolduan: Immune Sera, p. 171.

[5] Pasteur, Le traitement de la rage, 1886, p. 4.

[6] Von Behring: Die Blutserumtherapie, G. Thieme, Leipsic, 1892.

[7] Metchnikoff: L'immunité dans les maladies infectieuses, Paris, 1901

[8] Wright: Brit. Med. Jour., Jan. 30, 1897.

[9] Wright: Lancet, London, December, 1900; March 2, 1901; Sept. 14, 1901; March 29, 1902.

[10] Articles on Vaccine Therapy, editorial, The Journal A. M. A., April 26, 1913, p. 1306.

[11] Allen: Vaccine Therapy, p. 112.

[12] Wright: Lancet, London, March 29, 1902.

To prepare an autogenous vaccine, it is first necessary to obtain a pure culture of the infecting organism. If there is any doubt that the organism grown is the organism causing the disease, then it is necessary to do a complement-fixation test,[13] using the bacteria grown as the antigen. Having obtained a good growth of the disturbing organism, a twenty-four-hour culture is washed off in sterile 0.9 per cent. saline solution. It is best to use slanted mediums for the cultures to facilitate the washing off of the bacteria. This saline emulsion of bacteria must be sterilized, standardized and prepared for dispensing before the vaccine can be given to the patient.

Standardization.—The following apparatus and reagents are necessary: capillary pipet made by drawing out heated glass tubing, clean glass slides free from grease, wax pencil, a polychrome blood-stain and distilled water.

The saline emulsion of bacteria is centrifuged for a few minutes to free it from those bacterial clumps that are not broken up by shaking well. About ½ inch is marked off on the capillary tube with the wax pencil, and blood from a fresh prick on the worker's finger is drawn up to this point. A tiny air-bubble is next drawn in, and then the centrifuged emulsion is drawn up to the mark. This gives us in the capillary pipet equal portions of blood and bacillary emulsion separated by a tiny air-bubble. The capillary pipet is next emptied on a clean glass slide, the contents mixed thoroughly, and spread evenly over the surface of the slide by means of the edge of another slide. The slide is dried and stained with the stain,[14] in the same manner as for blood-smears. The relative number of bacteria and red blood-cells is then estimated by counting at least 500 red cells and all the bacteria found while counting them. In this way it is easy to compute the number of bacteria per cubic centimeter, remembering that there are 5,000,000 red cells per cubic millimeter. Example: If while counting 500 red cells, 100 bacteria are found, the problem is stated as follows:

$$500 : 100 :: 5{,}000{,}000 : x$$
$$x = 1{,}000{,}000$$

Therefore, there are in the bacillary emulsion 1,000,000 bacteria to the cubic millimeter, 1,000 million to the cubic centimeter.

Sterilization.—The emulsion is best sterilized by submerging the bottle containing the now standardized saline emulsion of bacteria in a water-bath at a constant temperature of 60 C. (140 F.) for one hour; 0.25 per cent. (1 capillary drop for 10 c.c.) compound solution of cresol is then added to keep the vaccine free from contamination. Such vaccines are best dispensed in 30 c.c. colored glass bottles, stoppered with rubber caps, so constructed that a hypodermic needle can be forced through, and that, by inverting the bottle, the required amount of vaccine can be drawn into the syringe. The rubber caps should be kept wet with pure compound solution of cresol.

DOSAGE

The dosage of a vaccine is of utmost importance, and the following rules will be of help:

1. The first dose, and the first dose only, is to be decided arbitrarily.

2. The second dose and all succeeding doses must be regulated by the effect of the first dose. Nothing can be more dangerous than an arbitrary increase of the dose of vaccine regardless of the clinical effect of the preceding dose; for two small a dose may be of no value whatever, and too large a dose may diminish instead of increasing immunity.

3. A marked local reaction at point of inoculation following the dose and accompanied by increased severity in the symptoms of the disease and slight or no improvement in the condition of the patient before time for the next dose, indicates that too large a dose has been given. The patient should be through the so-called negative phase by the end of the second day. When the dose is too large the negative phase is too severe and too long.

4. Slight local reaction following the injection, and accompanied by slight or no increased severity in the disease and followed by no improvement in the condition of the patient, indicates that too small a dose has been given. When the dose is too small there is no negative or positive phase clinically.

5. Slight or no local reaction accompanied by moderate, slight or no increase in the severity of the symptoms of the disease and followed by improvement in the condition of the patient indicates that a correct dose has been administered. After such a dose the negative phase is usually of about twenty-four hours' duration, but may be entirely absent. After the negative phase improvement in some or in all of the symptoms should begin, which is the beginning of the positive phase.

6. The second dose after a correct dose has been given should not be given until the negative phase has been well passed. This is usually within from two to four days. In acute illnesses it is well to begin with small doses which are followed by transitory negative phases, when it is possible to give a second dose within from twenty-four to thirty-six hours. In chronic disease it is safe to give much larger doses with the risk of severe negative phases, but in such cases it is necessary that the doses be given not too frequently. The interval between the doses should be increased or diminished in direct proportion to the severity and duration of the negative phase, and the duration of the positive phase, or period of betterment. The amount of increase or decrease in a dose is determined by the negative phase also, but inversely. A severe or prolonged negative phase indicates a longer interval and a smaller dose. It is well to be conservative, and so long as a certain dose produces adequate response, it is advisable not to increase it rapidly even though a larger dose can be given without a too severe negative phase. It is always well to err on the side of too small a dose and too long an interval. In the department of clinical pathology in Cornell Medical College, clinical symptoms have been found of most value in directing the dosage of vaccines.

INDICATIONS FOR VACCINE TREATMENT

As a general rule it can be said that all chronic bacterial disease can with advantage be treated by means of vaccine. Many acute diseases can be added to this list. Allen[16] asserts that there is benefit in nearly every type of known infection. The following is a list of the bacteria that have been advantageously employed in vaccine treatment:

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[13] Swift, Homer F., and Thro, W. C.: A Study of Streptococci with the Complement-Fixation and Conglutination Reactions, Arch. Int. Med., January, 1911, p. 24. Schwartz and McNeil: Am. Jour. Med. Sc., 1911, cxli, 693. Hastings, Thomas W.: Complement-Fixation Tests for Streptococcus, Gonococcus and Other Bacteria in Infective Deforming Arthritis and Arthritis Deformans, THE JOURNAL A. M. A., April 19, 1913, p. 1208.

[14] Allen: Vaccine Therapy (See index-dosage).

[15] Hastings: Oral communication.

Staphylococcus.—These bacteria differ much in species (*aureus, citreus, albus*) and little in different strains of the same species,[17] so an autogenous vaccine is not always necessary. The staphylococcal diseases treated by vaccines are boils, carbuncles, abscesses, periostitis, osteomyelitis, septicemia and pyemia. The staphylococcus is often a secondary infection in many diseases, such as acne and tuberculosis, and in such cases staphylococcal vaccine should be used in addition to the specific organism. The initial dose of a staphylococcus vaccine in acute conditions is usually from 20 to 50 millions, and in chronic conditions from 100 to 250 millions. The dose may often be gradually increased to an enormous amount such as 10,000 millions.

Streptococcus.[18]—Like the staphylococcus, the streptococcus is found in different species, but unlike the staphylococcus each species differs much in different strains and an autogenous vaccine should be prepared. Abscesses, cellulitis, septicemia, pyemia, erysipelas, recurrent tonsillitis and various joint affections have been treated by means of streptococcus vaccines. The pyogenic, hemolyzing and the green-producing streptococci differ much and should never be used interchangeably in vaccine therapy. The dosage is about one-fifth or one-tenth of that for similar conditions in staphylococcal infections.

Gonococcus.[19]—Torrey[20] and Schwartz and McNeil have done the most work with this organism. After much painstaking experimentation Torrey isolated two strains of gonococcus which have more immunizing effect than other strains. These strains he calls Strain A and Strain C. On account of the difficulty of obtaining an autogenous growth it is advised that these or similar strains be used in the preparation of vaccine for gonnococcus disease. There are no more brilliant results in vaccine therapy than those found in the treatment of gonorrheal arthritis. An initial dose of 20 millions is given and increased according to the clinical results.

Colon Group[21] (including typhoid).—General infections and especially pyelitis and other local infections caused by these bacteria have been benefited by vaccine treatment. Abundant evidence has been furnished by the British and American armies as to the value of these vaccines in the prophylactic treatment of disease.

Tuberculosis.—Practically every type of tuberculous infection has been treated with vaccine in the form of tuberculin, with different results in the hands of different men.

Pneumococcus.—There is no certainty that vaccine is of benefit in lobar pneumonia, but in the chronic pneumococcus infections good results are accomplished. Especially is this true of empyema.

Other bacteria that have been used in vaccine treatment to advantage are Pfeiffer's[16] and Friedlander's[16] bacilli and the bacilli of rhinoscleroma[22] and acne.

Much valuable work has been accomplished in the prophylaxis of plague[23] and cholera[24] and typhoid by immunization with their respective vaccines. The technic is the same for plague and cholera as for typhoid immunization.

Vaccines are for one purpose only, that is, to produce prophylactic immunity and to increase the resistance of an individual by active immunization, and they should never be used to the exclusion of other methods of treatment that tend to limit the extent of an infection. Abscesses should be drained, diet and hygiene must be considered, and vaccines must be recognized as very valuable adjuvants in combating infection.

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GENERAL ANESTHESIA IN THE SURGERY OF CHILDHOOD *

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A presentation of the subject of general anesthesia in children has become an annual occurrence of the Section on Diseases of Children of the American Medical Association, and should be a valuable one if it does nothing more than recall to mind the constantly active factor that narcosis constitutes in the morbidity and mortality of childhood's various surgical procedures. In addition to thus refreshing the hearer's minds, it adds from time to time record of the advances that have been made in the technic and practicability of the art, and acts as an incentive to further investigation and study.

The specialist in anesthesia, as in every other branch of surgery, brings forth that which is ultrascientific, often complex, not that he so far lacks in common sense as to expect every practitioner to adopt it, but that, having the ideal in mind, the general standard may be elevated.

Several important physiologic differences between adult and child bear on the subject of general anesthesia. The pediatrist knows them well, but he may not connect them practically with the question of surgical procedure and narcotics. The physical inferiority of evolutionary childhood in terms of resistance makes the young subject especially sensitive to the toxemia of so grave an interference with nature as the administration of a chemical poison to produce loss of consciousness. Despite the presence of what might be considered as healthy life functions, there is in children a marked absence of that acquired immunity which adults attain through contact with their environment. In this light the child has a small physiologic factor of safety.

The proportion of heat-radiating surface to body-weight is much greater than in the adult; the heat-regulating nervous mechanism has not developed to the high plane of efficiency found later in life. Sudden or great loss of heat becomes relatively a much more serious factor. The total volume of blood in the circulatory system of the child is small, so that comparatively minor losses become relatively more serious and dangerous. The general circulatory efficiency and blood-pressure depend more completely on cardiac action, and less on a well-developed peripheral propulsive factor than in the muscular adult, so that slight interference with the cardiac action draws immediately on the margin of safety of the child.

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[16] Allen: Vaccine Therapy.

[17] Wright: Studies in Immunization, p. 203.

[18] Emery: Immunity, p. 362.

[19] Cole and Meakins: Bull. Johns Hopkins Hosp., 1907, p. 223. Irons, E. E.: The Treatment of Gonococcus Arthritis by Injections of Dead Gonococci, and the Clinical Reaction Which Follows the Injections, Arch. Int. Med., May, 1908, p. 433.

[20] Torrey: Jour. Med. Research, 1907, p. 329.

[21] Allen: Vaccine Therapy, p. 241. Wulff: Presse méd., 1910, p. 97.

[22] Thro: Proceedings New York Path. Soc., 1910.

[23] Haffkine: Gov. Rep., 1905, p. 73.

[24] Haffkine: Immunity Against Cholera, Thacker Spink & Co., 1895, p. 66.

* Read in the Section on Diseases of Children of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

The nasopharynx is distinctly smaller in relation to extraordinary respiratory needs[1]; its sensitive lining mucous membranes are easily stimulated to abundant secretion of mucus and its musculature to spasm, particularly about the glottis (recall the glottic occlusion of catarrhal croup and laryngismus stridulus). In the presence of lymphoid hyperplasia these obstructive and exudative factors are multiplied a hundredfold.

In children poorly understood dyscrasias exist, such as the condition called status lymphaticus, the thymus persists, and mechanically, as well as by its hypersecretion, makes for lessened resistance to the toxemia of anesthesia.

When serious accidents do occur in general anesthesia, in the majority of instances it is directly or indirectly the result of carelessness, the confidence of inexperience, or where familiarity has bred contempt and neglect.

It occurs in every discussion of the matter, as it does in literature, that many men see no sense or need for the general warning against chloroform, and especially not in the case of children. Reports such as that of Grayson[2] of three thousand eight hundred chloroform anesthesias in nose and throat work without a death or serious collapse, prompt the promiscuous selection of this drug for such work without giving due weight, in considering the favorableness of the report, to the individual care and expertness which allowed the successful results reported. We all have considerable ego and easily conclude that we can do as well.

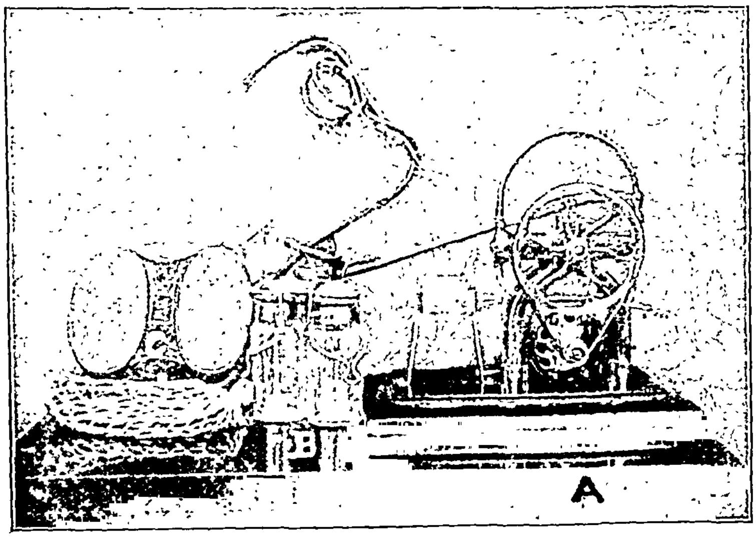

Fig. 1.—Vaporizing bottle set up for tracheal insufflation. *A*, electric motor pump; *C*, foot-pump; *D*, tracheal tube and forceps for introducing; *E*, third bottle of vaporizer used as mercury safety valve.

Chloroform has special advantages when used for children, and particularly in nose and throat work. These advantages prompt its selection by many, even in the face of its relatively great toxicity: 1. It is comparatively safe in the warmer climates. 2. It causes little, if any, increase of the nasopharyngeal mucus in cases in which such mucus dangerously adds to the respiratory obstruction which the operative manipulation inevitably produces. 3. It maintains an anesthesia for a longer period of time after the removal of the cone than does any other agent we employ—this is an advantage to the surgeon. 4. It is easy to carry and practical to administer. Despite all these advantages, however, the well-known and repeatedly demonstrated toxicity of the drug compared with others, makes it an agent to be avoided, and particularly so by the very ones who use it most, namely, the inexperienced, occasional users.

ERRORS OF TECHNIC THAT HAVE CONTRIBUTED TO AND CAUSED HIGH MORTALITY AND MORBIDITY, ESPECIALLY IN ADENOID AND TONSIL REMOVAL

Passing with mere mention the general necessity for minimum dosage of anesthesia and extreme care of administration with children, one comes to an analysis of the technical errors which cause damage or fatality in the usual anesthesia.

In the case of chloroform, its special toxicity has been mentioned, but the error of administration which renders the toxicity active in the hands of the inexperienced has most often, according to my observations, been the continuous dropping, if not pouring on the mask, of the chloroform during the period of apnea, caused by a half voluntary holding of the breath, a spasm of the glottis, or an obstruction in the pharynx from blood and mucus. During this period of apnea the chloroform is collecting in large concentrated dose under and around the mask, lying in wait, so to speak, for the period of hyperpnea which will succeed the apnea, so that with this period of hyperpnea or deep, exaggerated breathing, the toxically concentrated and large volume of drug is sucked into the lungs with resultant paralysis of the central respiratory mechanism. Its threshold for stimulation being so lowered by the overdose of drug that the normal stimuli fail to maintain their influence, and death occurs.

In the case of ether, with its relatively slight toxic effect on the vital nervous mechanisms, the local irritant influence becomes active in producing an exudate of mucus or spasm of the glottis, the which, being greatly exaggerated in cases of lymphoid hyperplasia, becomes, in conjunction with the operative manipulations, a serious source of obstruction to breathing. This obstruction to breathing produces a marked degree of asphyxia in the subject for adenoid or tonsil removal, and at the same time prevents the further inhalation of the anesthetic. Recovery from the anesthetic prompts the anesthetist to apply large, concentrated dosage in order to subdue the patient and in virtue of this irritating dose the state of mucus exudation and pharyngeal spasm is again instituted. Thus is established a vicious cycle of too superficial anesthesia on the one hand, with obstructed breathing and damaging asphyxia on the other. Obstructive apnea alternates with overconcentration and overdosage, and gives an anesthesia than which there could be no more perfect for the inconvenience of the surgeon or more detrimental to the child.

At first glance this condition might seem to apply to cases in which surgery of the throat alone is in question, but the observation of any intelligent anesthetist or surgeon will demonstrate its existence as a cause of trouble in many anesthesias in children. The use of the drop technic in children on an open mask or covered with towels focuses every element of the danger that lies in its abstraction of heat or refrigeration on a subject the least able to withstand bronchial exposure or loss of bodily heat. The virtue of its comparative safety is swallowed up in the risk of its refrigeration. The only excuse for the use of any direct application of the liquid ether to the subject's airway is ignorance on the part of the anesthetist or sacrifice of patient's welfare to the convenience of the surgeon.

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[1] Braislin, W. C.: Tr. Am. Otol. Soc., 1909, xi, part 2.

[2] Grayson: Laryngoscope, 1913, xxiii, 61.

If there be any truth in Crile's observations on toxic nerve assault or anoci-association, we have good theoretical reasons to add to the frequent practical demonstration, that the extreme fear which accompanies many inductions of anesthesia does real damage to the subject's central nervous system and may have considerable influence in instances in which sudden anesthetic collapse occurs. In some cases a child may be anesthetized while asleep, but more often some speedy, sure technic must be adopted to shorten the seconds of agony for parent and subject. For this purpose no doubt nitrous oxid, properly administered, is superior, all things considered, the exception being in very young infants in whom the few drops of chloroform necessary to produce the desired result are less to be feared than the gas. Perfume, or 25 per cent. essence of orange, on the mask, prior to the chloroform, has its advantages.

The preponderance of narcoses in operations for adenoids and tonsils in children and the many difficulties encountered by anesthetists and surgeons in securing satisfactory anesthesia, make its consideration a factor of some consequence. Recently, French[3] has reported some investigations on anesthesias in throat work in children and during the use of the upright position has sought to attain the most satisfactory narcosis with the gas-ether sequence, Dawbarn's sequestration anemia, and an oxygen vapor of ether administered through a mouth tube during the operation and at intervals. The work of the operator is of the slow, painstaking kind, and thoroughness is his watchword, so that the anesthesia is of importance. The nitrous oxid initiation is found wanting in the claimed difficulty of the transition from gas anesthesia to ether. The oxygen ether vapor during the operation is complained of as probably augmenting the bleeding. Nasal insufflation is suspected of damaging the accessory sinuses of the nose.

In opposition to these views I believe that a nitrous oxid initiation is of sufficient value to warrant the acquisition of the skill necessary for the smooth transition from gas to ether vapor, and that such skill can be easily acquired. Also that the marked practical and theoretical value of nasal insufflation through tubes introduced well into the pharynx prompts the selection of this technic and that insufflation so used offers little, if any, chance of damage to the sinuses of the nose. The vapor-delivering mouth-gag, the oral tube, and the nasal tube deliver the anesthetic vapor outside of the area of obstruction to breathing in adenoid and tonsil work and thus do not overcome the respiratory obstructive difficulties of this anesthesia. Where tubes are inserted well below the soft palate, positive pressure within the nasal cavity and damage to the sinuses are negligible factors. The anesthetic vapor is delivered well behind the obstructive difficulties in the upper pharynx and if a proper volume of air is insufflated, the excess in the form of outflow tends to force the blood and mucus forward in the mouth where sponges or suction pump can remove them.

There are two operations especially that are performed on children in which the operator and patient are so handicapped by the mechanical question of anesthesia that I am certain that many deaths result directly because of the anesthetic. These two procedures are for sarcoma of the maxillae, especially the superior, and cleft palate. In both operations long periods of asphyxia are produced by the mechanical manipulation within the subject's airways, and in sarcoma of the superior maxilla especially from the hemorrhage that is bound to occur even with ligation of the external carotid.

INTRATRACHEAL INSUFFLATION ANESTHESIA

Tracheal insufflation anesthesia in children is especially easy of performance and offers such perfect anesthesia without one moment's anxiety for asphyxia or inhalation of blood and mucus, that any surgeon who operates once with its aid certainly would never attack a similar operation without it. The blood and mucus are actually washed out of the nares by the return flow of air, and the constant pink color of capillary circulation testifies to the complete oxygenation; the surgeon's *work is not interrupted by the intermittency of the* narcosis and the subject does not run the gauntlet of dangers from improperly maintained, recklessly toxic anesthesia.

In children the glottis is easily reached by the guiding index-finger of the left hand, the rubber catheter (18 to 22 size, with opening at the end and side) is easily introduced with forceps shown. The tube is then fastened to the angle of the mouth by a suture passed through the cheek and tube, and the anesthesia carried on by even so simple an arrangement as the vapor bottles shown in Figure 1.

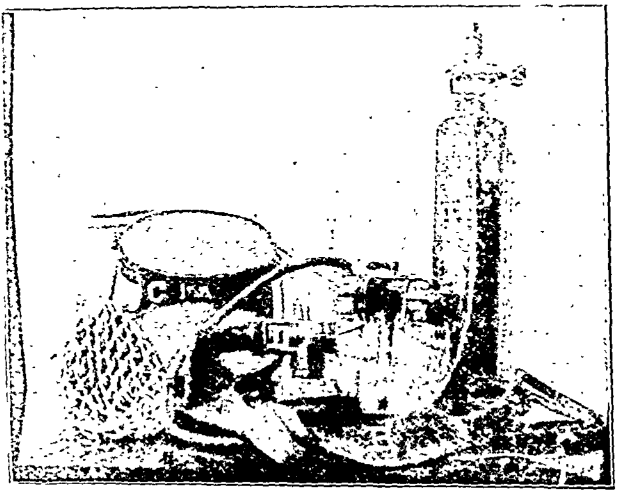

Fig. 2.—Nitrous oxid-ether vapor sequence apparatus. *A*, vaporizing bottles connected with bag *B* at *F*; *C*, foot-pump; *D*, Gwathney-Woolsey gas mask; *E*, gas tank connected with bag at *F*.

ANESTHETIC TECHNIC ADOPTED BY THE AUTHOR

Sedative medication in the form of morphin products, etc., as a preliminary to anesthesia in children comes under the general head of contra-indications in the extremes of life, so that seldom, if ever, is it used.

Initiation of the narcosis is accomplished in as speedy and certain a manner as is consistent with safety, by the selection of one of two methods, viz.: Nitrous oxid gas or the essence of orange (25 per cent.) on a mask, followed by chloroform in carefully administered, intelligently observed dosage. These are followed by ether, in some way vaporized at a distance from the little patient's airways.

The gas-ether sequence is to be preferred if handled in a proper manner, and to be condemned if not so handled. The chloroform-ether sequence is safer than a poorly administered gas-ether. The technic which I use is the following:

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[3] French, T. R.: New York Med. Jour., 1913, xcvii, 1061.

The Gwathmey vaporizing bottles (A, Fig. 2) are properly filled with ether and water; 1 dram of essence of orange (25 per cent.) is placed in the water bottles. The foot-pump of the type shown (C, Fig. 2) is attached to bottles and from these to the lower end of the small breathing bag (B) and at this same point is attached a tube from a small tank of nitrous oxid. The bag is filled three-quarters full of gas; the mask (D) is placed quickly over the little patient's face, and in fifteen seconds unconsciousness ensues. After two breaths of gas have been taken, the foot-pump forces the weakest of ether vapors from the bottles into the bag where, like the gas, it is rebreathed, only a slight expiratory escape being allowed. This continues until deep ether narcosis ensues, at which time the breathing bag and mask are thrown aside and either a small vapor delivering Yankhaur mask is applied and connected with the bottles, or nasal tubes are inserted to the deep pharyngeal space. In either case, anesthesia by a nonrefrigerating, minimum-dosed technic is continued. In ordinary anesthesia, that is, where access to the mouth or face is not needed, a towel or two, thoroughly covering the mask and confining the tidal air, gives the subject the benefit of considerable rebreathing with its carbon dioxid beneficence.

The ether indicator on the vaporizer rarely, if ever, goes above half way between ether and air. Instead of the foot-pump a stream from the oxygen tank may be used to carry over what ether vapor is needed, especially in those grave risks which test the skill of every surgical procedure.

The vapor method of administering anesthesia, including as it does such procedures as the pharyngeal insufflation recommended a year ago at Atlantic City by Dr. Pinneo, of Newark, N. J., and the tracheal insufflation for special surgical work, is one extremely easy of application, and because of its many virtues should be more generally adopted. An ordinary cautery bulb attached to a wash bottle of ether is superior to a drop technic on an open refrigerating mask and can be arranged by anyone without noticeable expense.

TECHNIC FOR ADENOID AND TONSIL WORK

As in any case initiation of the anesthetic is accomplished with the nitrous oxid-ether sequence, given as described above, and at the point where the breathing bag is thrown aside one or two soft rubber catheters are introduced through the nose and into the pharynx a distance equal to that from the external auditory meatus to the nares so that their ends rest just above the glottis, ether is thus insufflated to a point behind the obstruction of blood, instruments and fauces, and anesthesia is maintained by means of the foot-pump or the electric motor and pump (Fig. 1). The use of this latter means of air-supply furnishes coincidently one of the most valuable features of the technic, namely, a combined suction tube and tongue depressor. This suction tube, attached as it is to the air intake of the motor pump, and having an ordinary aspirating bottle between it and the pump, acts as a perfect aspirator of the throat contents during the operation, giving a clear field of vision to the operator and assisting materially the anesthesia by further freeing the airways of obstructing blood and mucus.

The vapor-delivery tube attached to a mouth-gag fails fully to maintain the narcosis because it delivers its anesthetic outside the obstructed area, and having the anesthetic vapor as strong as possible or in as large quantity as can be produced, avails nothing, inasmuch as the throat is obstructed at the fauces.

Nitrous oxid and oxygen as an anesthetic for adenoid and tonsil removal is not generally satisfactory, for the reason that it requires cumbersome apparatus to supply the large volume of gases needed in rendering them effectual through the nose; it produces a degree of cerebral congestion very productive of hemorrhage, and operator and anesthetist must be not only trained to work together, but in sympathy with each other's efforts and shortcomings.

RESPIRATORY RESUSCITATIVE MEASURES IN ANESTHETIC COLLAPSE

The very great majority of anesthetic deaths in both adults and children are of respiratory origin primarily, and in such accidents our efforts toward revival have been in no minior degree trivial. Artificial respiration as performed by the old recognized Sylvester or Shaefer methods has served well in some comparatively few cases, but its limitations are many. Oxygen, applied as it ordinarily is, by means of a tube placed in the nose, a funnel over the mouth, or similar procedure, almost provokes a smile when one realizes the state of the glottis, respiratory center and lungs when such collapse has occurred.

During a faulty narcosis with varying degrees of obstructed breathing, often progressively worse as the anesthesia proceeds, there is a constant negative pressure created within the chest by the violent muscular effort to obtain air through the obstructed throat, and when this continued asphyxia finally ends in respiratory collapse the epiglottis is so firmly sucked down against the vocal cords that its elevation by the finger is like pulling a cork out of a bottle; holding the jaw forward, even traction on the tongue under these circumstances is absolutely ineffectual in raising it, so that the ordinary artificial respiration with oxygen delivered outside the obstruction (in the mouth, for example) is next to useless. This condition of glottis and epiglottis was noted in utilizing the endotracheal tube for resuscitation of patients whom intern-anesthetists in hospitals had paralyzed, and in the presence of such physical conditions I believe that tracheal intubation offers the best means of quickly instituting artificial respiration in anesthetic collapse.

Another interesting phase of endotracheal artificial respiration has been developed in newly-born infants of atelectatic disposition where breathing has failed to materialize under the ordinary gymnastic manipulations. Any pediatrist who has used the O'Dwyer tubes can insert a small rubber, stiletted catheter into the glottis of a child without even the difficulty attending ordinary intubation, and though a mercury safety-valve between the oxygen tank and lungs is a primary requisite, emergency occasions could be met by a careful manipulation of the oxygen stream through the ordinary water bottle or a foot pump. Meltzer's recently described respiration valve effectually interrupts the stream of insufflated air or oxygen. This procedure in anesthetic collapse, sedative drug or gas poisoning, and post-partum atelectasis is a distinct advance in the means of resuscitating respiratory failure.

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Metabolism and Dietetics.—The whole subject of metabolism and its relation to dietetics reminds one somewhat of working out a picture puzzle, where not only one picture has been cut up into intricate shapes, but where numerous pictures have been cut up and confused. One worker fits in his little bit, and another his, and a third likewise, and so on, and then some one else discovers that two different pictures are being confused; and so the work goes on until every now and then the master mind comes along and groups the discovered bits aright.—Friedenwald and Ruhräh, "Diet."

HYDROTHERAPY IN NERVOUS FATIGUE [*]

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Fatigue may be defined as an exhaustion of the bodily, nervous or mental powers, or of all combined. In the neural fatigue that we are to consider, it may be stated in broad terms that the person suffers in all the various spheres mentioned. Fatigue in the normal subject is not unpleasant, but a rather delightful preface to restful restoration.

The chemical conditions of fatigue lie in the production of the so-called "fatigue substances," particularly carbon dioxid and lactic acid. These substances in small quantities increase protoplasmic activity and augment muscular energy. The preponderance of evidence seems to favor the idea that there is a high degree of resistance to fatigue on the part of the brain and spinal cord, as well as the nerve fiber itself.

Fatigue is a general systemic sensation like hunger and thirst; it has its localized sensations, more especially in the eyes and muscles. Fatigue may become so overbearing as to become painful and destroy the desire of life. Brunton[1] says that so long as the muscles are connected with the central nervous system complete exhaustion of the muscle is impossible, for before it becomes paralyzed by its own exertion, the sensation is perceived by the nerve-centers and the nerve stimuli, which proceed to the muscle, are so much diminished that complete paralysis is never produced. The sensation of fatigue is perceived in the central nervous system but is produced by peripheral exertion. Fatigue is overcome only by the removal of those products that are the causative factors of the condition, and is therefore a matter of the relative balance between available energy and the resistance against which this energy must work.

We must clearly distinguish between genuine fatigue and that pseudo fatigue which results from a lack of the habit of industry. As Lee[2] has remarked, "most of us work too briefly and rest too long." Offner[3] well remarks that subjective symptoms offer an unreliable measure for fatigue, which he was able to substantiate by a study of physical and mental tests. The normally fatigued nervous system of one who has not made great drafts on that wonderful neural reservoir of which William James[4] speaks protects itself by seeking rest and recuperation, and it is now a fairly accepted belief that we often rest because we do not wish to be fatigued.

That the mental attitude has a great deal to do with the question of perception and feeling of fatigue is a well-known fact. The power of music to quicken the steps of the tired soldier, the influence of the emotions in redoubling one's strength, and the driving force of reward displace the feeling of fatigue in many instances. We instinctively feel that fatigue calls for rest; our minds become impressed with this fact and the continued consciousness of the fatigued state serves to intensify the consciousness to a greater or less degree, depending on the suggestibility of the individual.

CAUSES OF FATIGUE

Many writers assign our complex civilization as the main cause of neural fatigue, but I would prefer to say that neural fatigue more often results from a lack of adaptability than as the direct effect of civilization on the central nervous system. It is improper mental work *accompanied* by irritation and worry rather than mental work *per se* that breaks one down. Muscular overexertion can undoubtedly bring about neural as well as mental fatigue, owing to the intimate physiologic connection between the central nervous system and muscular groups; in fact it is not a muscular proposition, but a neuromuscular one. Those who have had occasion to observe an athlete after strenuous exertion, a Marathon, or a six-day bicycle race, have noted in this strong healthy person physical and mental symptoms similar to those seen in the neuroses and psychoses. It may be interesting here to note that muscular fatigue is much more quickly recuperated from than that fatigue which results from prolonged mental strain and worry. When one's labor is pleasing and performed without internal mental friction, the work may be kept up for many months and years without nervous tire, whereas half the same amount of labor that is disagreeable will be prone to produce nervous breakdown and imperfect work. Labor unsuited to the individual is more apt to provoke fatigue than that for which he is specially fitted. If to these conditions of occupation be added insufficient hours of rest, worry, anxiety and the lack of home peace, we may expect nervous fatigue. While I believe that the sexual sphere may be productive of many cases of nervous fatigue, still I do not believe that it occupies the somewhat exaggerated position that certain writers seem to give it.

CLASSIFICATION

I would classify nervous fatigue as follows:

1. Fatigue resulting from inherent nervous weakness; hereditary factor.
2. Fatigue resulting from retained metabolic wastes; non-oxidative factor.
3. Fatigue resulting from toxins; non-eliminative factor; (*a*) endogenous; (*b*) exogenous..
4. Fatigue resulting from circulatory defects.
5. Fatigue resulting from organic diseases.

1. Fatigue resulting from inherent nervous weakness. Persons in this class are doomed by hereditary entailment of an unstable nervous system to a life of neural fatigue. They are persons who seem to "short-circuit" their nerve force and are thus "usually run down"; who live an existence on a narrow margin and are constantly making overdrafts on their limited capital.

2. Fatigue resulting from retained metabolic wastes. In this class we find a large number of persons whose metabolic processes, eliminative organs and tissues seem to be inadequate to the demands of caring for the removal of the normal or pathologic wear and tear of the body. A failure to oxidize these waste products is probably largely due to a disturbance of the so-called "internal secretions"; the secretions from the various ductless glands stimulate the removal of waste and favor cell reconstruction. An active circulation for the removal of waste products is a *sine qua non*, and the influence of hydrotherapy in developing a flexible circulation enables us to bring about brilliant results in these cases.

3. Fatigue from toxins, endogenous and exogenous. A great many, if not the majority of toxins, especially the putrefactive varieties, are produced chiefly in the intestinal canal, and a moderate sterility of this system

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[*] Read in the Section on Pharmacology and Therapeutics of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

[1] Brunton, Lauder: On Being Tired; Practitioner, London, October, 1910.

[2] Lee, Frederick S.: The Nature of Fatigue, Pop. Sc. Month., February, 1910.

[3] Offner, Max: Die Geistige Ermüdung; Berlin, Reulber and Reichard, 1910.

[4] James, William: Energies of Man.

is undoubtedly of great advantage in nervous fatigue. The presence of indol, skatol, phenol, ammonia and other toxic products, to say nothing of the toxins arising from the various bacteria themselves, must be promptly removed. That weariness may be produced by the direct action of these chemical substances on the brain itself and on the motor nerves and muscles is now accepted by many authorities. It is in this way that neural fatigue is often brought about. Bernheim[5] believes that the toxin or toxins circulating in the blood have a special affinity for certain tracts in the nervous system and that this is frequently revealed by exaggeration of tendon reflexes, and further, that the toxic factor often underlies a case that is supposed to be due to some emotional shock, physiologic strain or passing infection. He says that suggestion may aid the functional elements, but is powerless against the underlying dyscrasia of the nervous system.

4. Fatigue resulting from circulatory defects. A failure of circulatory activity is frequently an added cause of fatigue, supplementing the effects of imperfect metabolic functioning and the formation and retention of toxins of all kinds. This may produce a state of hypertension or a great variation of blood-pressure, which is sometimes abnormally low, sometimes abnormally high.

5. Fatigue resulting from organic disease. Neural fatigue resulting from organic defects will, in a given case, depend on those pathologic changes that constitute the disease. Among the most common of all the underlying organic diseases that produce general nervous fatigue must be mentioned arteriosclerosis,[6] in which the sclerotic or fibrotic changes shut off the quantity of blood to the part, depriving it of the power to nutritionally care for itself. That many other organic diseases produce fatigue and exhaustion is well known, but the foregoing paradigm will serve for the purpose of calling attention to the necessity of carefully eliminating this factor in the diagnosis of fatigue conditions.

DIFFERENTIATION

It is not possible to separate nerve fatigue according to its causation, save in rare instances. It is well to bear in mind that nervous fatigue is an exceedingly complex condition and that the foregoing causes frequently combine, though one of these conditions may be so predominant as to make it the principal or real causative factor in the case.

SYMPTOMS

Pathologic nervous fatigue is induced by minimal exertion, or an exertion that would fail to produce exhaustion in a normal person. Fatigue, lassitude and exhaustion when established are present even without exertion, and the fatigue is increased by physical as well as mental activity. Fatigue is nearly always associated with a more or less marked emotional condition. Fatigue, irritability, emotionalism and generalized mental depression form the characteristic basis of nearly all cases of nervous fatigue. The diagnosis of neural fatigue is often made when the symptoms are really due to an underlying organic disease, like tuberculosis or syphilis. Even neurasthenia is not a correct term to cover all cases. Nervous fatigue is very common; genuine neurasthenia, as compared to the number of cases so labeled, might be designated as rare. A much closer restriction of this designation would be beneficial to both physician and patient.

METHODS

The methods to be employed in the treatment of nervous fatigue naturally fall under two categories:

1. General systemic measures, the aim and object of which is to remove the underlying causative conditions and to tone, strengthen and reconstruct the nervous system.

2. Local measures for the palliation or relief of localized symptoms.

Each of these can be further subdivided into (1) general systemic measures (*a*) in the home and (*b*) sanatorial; (2) local measures (*a*) in the home and (*b*) sanatorial.

It is my belief, perhaps based on personal experience and not perhaps without bias, that private hospitals or sanatoriums offer the best places for the treatment of these patients.

Hydrotherapy is by far the most important of all the physical measures used in the treatment of nervous fatigue. Long experience has led me to the belief that, were I limited to one method alone for the management of this disorder, I would unquestionably choose hydrotherapy. The hydriatic prescription can be intelligently applied to the patient only when it is based on a thorough diagnostic knowledge of the practical case in hand. With this as a basis and a thorough knowledge of the physiologic action of hydrotherapy and its associative procedures, we are then in a position to "temper the wind to the shorn lamb." It is my opinion that the nervously fatigued do best in some small institution, thoroughly equipped, owing to the needs of complex apparatus, by means of which the various forms of douche can be administered, and to the further fact that the physician in this line of work acquires a knowledge and experience that enables him to readily meet the problems that arise in every case of this disorder.

Hydrotherapy strikes at the root of the trouble; endeavors to remove the underlying cause by physiologic action, lessens nerve sensitiveness, invigorates and strengthens nerve processes, and raises the general mental feeling of buoyancy. In cases of nervous fatigue, the treatment must be persisted in for some time, from three to six months or even longer. It has for its object not alone the relief of the fatigue, but also a reconstruction that will resist morbid influences after the patient returns to his former life. It must be borne in mind that the douche to the spine, under various pressures, is a powerful agent in arousing weakened spinal centers to activity; it develops wide-spread spinal reflexes, improves the nutrition of the cord and centers, by strong fluxive or hyperemic results, to the starved and irritable centers. Few cases are so simple that they do not require a combination of methods.

The principles that underlie the treatment of nervous fatigue by hydrotherapy and its procedure, together with the methods that can be employed, follows:

1. A preliminary sweating procedure. This draws the blood to the surface, stimulates glandular activity and prepares the patient for the cold application. Methods: Full dry-pack, full wet-pack, vapor or steam; heat, superheated dry hot air, full bath and incandescent electric-light bath. The last-named is undoubtedly the best.

2. A warm application. The warm water cleanses the skin by its mecnanical effect, increases the dilatation of the blood-vessels and prepares the patient for reaction. Methods: warm full bath, rain bath, needle bath,

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[5] Bernheim, L.: Rev. de méd., Paris, 1909, xxix, No. 4.

[6] Pope, Curran: The General Physiologic and Therapeutic Action of Hydrotherapy, Jour. Advanc. Therap., May, 1908.

douche (fan, spray, jet and Scotch), especially applied to the general body surface, spine and liver.

3. A cold application. This is tonic, reconstructive, eliminant and rejuvenating. In the nervously fatigued this should always follow sweating procedures and warm applications. Object: to train patients to stand strong pressures and cold temperatures, which should always be brief. Methods: sponge, affusion, dripping-sheet, half bath and affusion, shower, rain-bath, needle and douche (fan spray, jet and Scotch).

4. Reaction. This is the absolute essential and fundamental necessity of all hydriatic methods in the treatment of nervous fatigue. Reactions is that sense of glow, stimulation and feeling of pleasure and comfort, combined with a pinking of the skin, a general tonic state of the circulation on the surface, etc., that follows a moderate application of cold.

5. Brevity. All forms of treatment in nervous fatigue should be brief. They should commence with the shortest possible duration, of the mildest temperatures and lowest pressure, all of which are gradually increased. When the maximum application is reached of temperature and pressure it should still be encompassed under the term "brevity."

6. Frequency. The applications may be made from three to six times weekly, best in the forenoon, from two to three hours after eating and usually followed by rest.

7. Patients do best on a combination of methods; for example, an electric-light bath, followed by warm or hot rain-needle, fan or jet, rapidly reduced to a lower temperature, and this in its turn followed by a cold anal douche for constipation. In my experience, which covers the range of drug, mechanical and so-called physiologic methods, I have never yet found anything to equal the rain, needle and jet douche.

PLANS OF TREATMENT

Plans of treatment may be divided into those that may be employed (*a*) at home and (*b*) at sanatoriums. I have already[7] outlined these as follows:

(*a*) A plan suitable for the home or for those whose reaction is poor would be the following: Dry-pack for from one-half to one hour, followed by a cold sponge with water at a temperature of 70 F. for three minutes, with vigorous friction. As soon as this point is reached dispense with the dry-pack and give the dripping-sheet at 65 F. for three minutes, with good friction, while the patient stands in a foot-tub of water as hot as can be borne. Reaction must be secured. This treatment is generally administered in the morning, and when this time is selected give the general wet-pack at 65 F. for one hour at bedtime. When the patient is removed from the pack he is rapidly dried and no reaction is sought. The advantage of this method of treatment is to obtain the stimulating and tonic influences of the dripping-sheet in the morning and the sedative and sleep-producing effects of the wet-pack at bedtime.

Another good method is to have the patient sit in a half bath with water at from 102 to 104 F., while the attendant gives him an affusion at 80 F. At this point the patient should stand in the tub in water as hot as can be borne, while the affusion is given to the entire body, or the water is thrown with force against the body from a large dipper. This may be further modified by first immersing the body in warm water, then giving a salt rub or glow, followed by the affusion. The warm full bath (104 to 105 F.) for five or seven minutes, followed by the salt rub and finally by the cold shower at from 70 to 65 F., will be found useful. Reaction is essential.

(*b*) "In *institutions or sanatoriums* many women and nearly all men may *commence* with the following, particularly if the patient is up and going about: Electric-light bath or hot-air bath until perspiration commences, followed by the circular or horizontal rain-bath at from 100 to 104 F. for one and one-half to two minutes, reduced to 75 F. for one-fourth minute, with a pressure of 20 pounds. Reduce the temperature 2 degrees daily to 60 F. and increase the pressure 2 pounds daily until 30 is registered. After about a week of this treatment we may add to the foregoing the fan douche at a temperature of 60 F. to the entire body for from five to ten seconds. The next move should be the following: Electric-light or hot-air bath until perspiration take place, followed by the horizontal or circular rain-bath at 100 to 104 F. for one minute, reduced to 60 F. for from fifteen to twenty seconds, pressure 30 pounds, to be followed by the jet douche to the spine and legs at 60 F. for five seconds. An excellent method of treating these cases after reaction has been well established is to apply the jet douche to the spine at a temperature of 105 F. for a half to one minute, followed by the jet to the spine at a temperature of 60 F. for ten seconds, increasing the temperature of the hot water 2 degrees daily until 110 or even 120 F. is reached, at which point it will usually be found that the patient can tolerate no higher temperature. This is especially useful in men who are physically strong and who complain of persistent "head feelings" and tender spine. Neurasthenics do not, as a rule, stand the Scotch douche well. Certain prominent symptoms often demand special attention.

MEETING SPECIAL SYMPTOMS

Hydrotherapy offers a fertile field for the meeting of the various symptoms, objective and subjective, that occur in nervous fatigue.

Insomnia. The insomnia can best be met by the cold-pack or dripping-sheet at bedtime, or the so-called "Neptune's girdle" or trunk compress, consisting of a coarse linen bandage wrung out of water at a temperature of 65 F. and covered by several layers of the same material to exclude the air. It should be worn all night. A most excellent method is the neutral bath, temperature from 94 to 96 F. for from twenty to sixty minutes. Simple measures that sometimes produce sleep are the use of Chapman's ice-bag to the spine, or a hot and cold spinal sponge. In addition, we may give from 6 to 12 ounces of warm milk on retiring, either plain or predigested. A short foot-bath should be given.

Headaches and head pressure. For headaches and head pressure the fomentation applied for five or ten minutes twice, and followed by a cold compress, is very effective. If the headache is congestive, the hot foot-bath should be used, followed by the ice-bag to the nape of the neck and the cold compress to the forehead. Sitz-baths at 90 F., reduced to 65 F., or cold foot-baths, will often give relief. If the headache is persistent, indefinable and annoying, it can sometimes be permanently relieved by means of the Scotch or alternate douche to the spine and legs.

"Spinal irritation," so-called, or the "neurasthenic spine," is best met by general douche treatment to the spine. When this is not effective, the Scotch douche at from 120 to 125 F. for thirty seconds should be used, followed by a temperature of from 50 to 60 F. for from five to ten seconds, with four alternations. Sometimes the hot and cold spinal sponge at bedtime is successful.

For *eye pains* and *muscae volitantes* the fomentation to the eyes and forehead should be employed, followed by the cold compress for half an hour, repeated, if necessary, several times daily.

For *ovarian irritation* and *vaginal discharges,* hot vaginal irrigation should be used daily or twice daily, and hot trunk pack applied sufficiently low down to include the pelvis and hips; that is to say, to the middle of the thighs.

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[7] Pope, Curran: Practical Hydrotherapy, Cincinnati Medical Book Company, 1909.

Sexual irritations can often be promptly relieved by the hot sitz-bath from 110 to 115 F. for from five to ten minutes, followed by the cold jet douche to hips and lower spine for fifteen seconds.

Menstrual delay and pain are best met by the hot sitz-bath from 110 to 115 F. for from ten to fifteen minutes, followed by cold affusion over the hips. The warm (not hot) vaginal douche favors the commencement of the period.

For *anorexia,* a glass of ice-water should be given one hour and the ice-bag applied for half an hour before meals. It is astonishing sometimes what results will follow this simple treatment.

For *dyspepsia nervosa* the patient must be placed on general treatment, although the trunk pack at a temperature of 65 F. for one hour is sometimes helpful.

Rectal irritation and *constipation* are greatly benefited by the use of the perineal and anal douche as hot as can be borne, followed by a cold douche of from 60 to 50 F.; stronger revulsive effects may be obtained by an alternate hot and cold application.

Colitis and *intestinal catarrh* are best met by means of the dripping sheet, followed by the sitz-bath from 70 to 65 F. for from three to ten minutes, during which time the attendant and patient rub the abdomen and hips thoroughly.

Gastro-enterocoloptosis is best met by an abdominal supporter and the Scotch or alternating douche to the abdomen, under weak pressure, gradually increased. The temperatures may be increased and decreased gradually.

Backache is often promptly relieved by the jet and Scotch douche or, what is better than all others, the Scotch jet douche.

Vertigo is best met by general treatment and the hot and cold jet to the spine.

PREVENTION

Prophylaxis and the maintenance of health after recovery are best secured by a combination of factors, of which hydrotherapy is the most important. A person who has been nervously fatigued should try and adapt himself to reality and to the work he has to do. All
hygienic measures and the consistent and persistent minial
of cold water will maintain a degree of heal produce
little short of surprising. As I hav ssitude and
remarked, it would be far better for even without
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RELATIONS TO DRUG MEDI loser restriction

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absence of acne is noticeable, especially in epilepsy; hydrargyrum bcomes much more effective and rapid in its action in syphilis; smaller doses of hypnotics are required for insomnia; drug habitués and alcoholics require smaller doses and finally tonic (that is, cold) hydrotherapy requires a much lessened quantity, as well as number of drugs, in the medication of gastric disorders.

REMARKS

Condemnation of unscientific hydrotherapy cannot be too strongly urged. "How many crimes, O Hydrotherapy, have been committed in thy name!" To this there is no answer. From a considerable acquaintance with users of hydrotherapy, I am inclined to believe that the greatest danger lies in the lack of a real diagnosis, the separation of the sheep from the goats. With a knowledge of its action not alone in nervous fatigue, but also in a whole host of disorders and diseases, a failure to use it is, in a sense, a medical crime. It is too valuable and important a remedy, too far-reaching and useful, to be relegated to the charlatan, quack and that abomination of all hydriatists, the "giver of baths." Hydrotherapy belongs to the medical profession; it is a scientific measure, capable of scientific application, and must never again be allowed to drift to destruction on the rocks of therapeutic nihilism.

CONCLUSIONS

1. Nervous fatigue is a complex state of mind and body, largely toxic.

2. Its origin is due to an inability on the part of the individual to adapt himself to heredity, environment and reality.

3. Its symptoms are many and occur as an entity or in conjunction with many other disorders and diseases.

4. Hydrotherapy is an ancient measure, universally found, possessing cleansing, antiseptic, thermic and mechanical powers.

5. Its physiologic action on the human body is largely brought about through disturbing influences of temperature, and mechanical effects on peripheral sensory nerves.

6. Brief applications followed by reaction do not particularly affect temperature.

7. In that will [illegible] is increased on the surface by heat,
ient returns to his former life. It must be borne in mind that the douche to the spine, under various pressures, is a powerful agent in arousing weakened spinal centers to activity; it develops wide-spread spinal reflexes, improves the nutrition of the cord and centers, by strong fluxive or hyperemic results, to the starved and irritable centers. Few cases are so simple that they do not require a combination of methods.

The principles that underlie the treatment of nervous fatigue by hydrotherapy and its procedure, together with the methods that can be employed, follows:

1. A preliminary sweating procedure. This draws the blood to the surface, stimulates glandular activity and prepares the patient for the cold application. Methods: Full dry-pack, full wet-pack, vapor or steam; heat, superheated dry hot air, full bath and incandescent electric-light bath. The last-named is *undoubtedly* the best.

2. A warm application. The warm water cleanses the skin by its mecnanical effect, increases the dilatation of the blood-vessels and prepares the patient for reaction. Methods: warm full bath, rain bath, needle bath,

pharmaceutical houses were examined. A comparison of the potassium iodid claimed to be present in the product of the "physicians' supply houses" with that indicated by an estimation of the iodin content of these tablets showed a range of from 88.6 to 106.6 per cent. of the claimed amount. The products of the five "regular" pharmaceutical houses showed a range of from 99.1 to 101.4 per cent. of the claimed content.

This examination shows that the products of the "pharmaceutical houses" show a markedly smaller variation than those of the "physicians' supply houses." That price had nothing to do with the variation is shown by the fact that the lowest-priced brand is among those which have the highest content of potassium iodid. Table 2 gives the results obtained.

TABLE 2.—ANALYSES OF POTASSIUM IODID TABLETS

Firm	Average Weight of 10 Tablets Gm.	Potassium Iodid* Percentage of Claim Per Cent.
1. F. S. Betz Co.	0.3334	101.6
2. Columbus Pharmacal Co.	0.3303	101.6
3. Flint, Eaton & Co.	0.3305	101.4
4. Eli Lilly & Co.	0.3252	100.2
5. McCoy Howe & Co.	0.3625	102.6
6. H. K. Mulford Co.	0.3266	100.4
7. The National Drug Co.	0.3281	99.8
8. Norwich Pharmacal Co.	0.3224	98.6
9. Parke, Davis & Co.	0.3277	99.6
10. Pitman-Myers Co.	0.3298	100.8
11. Ray Chemical Co. (2 gr. tablets).	0.1244	94.5
12. A. E. Remick Pharmacal Co.	0.3401	104.4
13. Schieffelin & Co.	0.3243	99.1
14. O. F. Schmid Co.	0.3258	93.8
15. Sharp & Dohme	0.3316	101.4
16. Sutliff & Case Co.	0.3640	104.4
17. Toledo Pharmacal Co.	0.3477	106.6
18. Truax, Greene & Co.	0.2901	88.6
19. The Wm. A. Webster Co.	0.3233	99
20. The Zemmer Co.	0.3164	96.6

* The potassium iodid content was determined by pulverizing ten tablets, thoroughly mixing the powder and from 0.2 to 0.3 gm. portions of the powder taken and titrated according to the method of Andrews (Jour. Am. Chem. Soc., xxv, 756). The average weight of ten tablets was determined and from this and the potassium iodid content of the material constituting the tablets the potassium iodid content of the average tablet was calculated; the content thus found, compared with the claimed amount of potassium iodid, indicated the percentage of claim found.

FLUIDEXTRACT OF HYDRASTIS (GOLDEN SEAL)

Fourteen specimens from the "physicians' supply houses" were obtained and five from "regular" pharmaceutical houses. The specimens were assayed according to the method of the U. S. Pharmacopeia. The products of the "physicians' supply houses" were found to range from 84 to 135 per cent. of the amount required by the U. S. Pharmacopeia, and the products of the "regular" pharmaceutical houses ranged from 82 to 119.5 per cent. of the U. S. Pharmacopeia standard. While as before the products of the "physicians' supply houses" show a wider variation than the products of the "regular" pharmaceutical houses, the difference in this case is not great. The lowest values of the two classes of firms are practically the same.

Since the assay method for fluidextract of hydrastis has been official for nearly eight years and is most simple, it is rather surprising that a large pharmaceutical firm, supposed to have well-equipped scientific laboratories, should still be unable to approximate more nearly the U. S. Pharmacopeia standard. Table 3 gives the results obtained.

To test the accuracy of the manufacturing methods and the technical training of those responsible for the products sold by the "physicians' supply houses" three pharmaceutical preparations were selected, namely, solution of potassium arsenite, or Fowler's solution, ointment of zinc oxid, or zinc ointment, and fluidextract of digitalis.

SOLUTION OF POTASSIUM ARSENITE (FOWLER'S SOLUTION)

Specimens of solution of potassium arsenite from fourteen "physicians' supply houses" and five "pharmaceutical houses" were examined. A comparison of the arsenic content claimed to be present in the products of the "physicians' supply houses" with that given by the U. S. Pharmacopeia method for the determination of arsenic shows a variation of from 80.4 to 103.9 per cent. The products of the "pharmaceutical houses" showed a variation of from 96.7 to 102.2 per cent.

TABLE 3.—ANALYSES OF FLUID EXTRACTS OF HYDRASTIS (GOLDEN SEAL)

Firm	Alcohol Declared, Per Cent.	Hydrastin (Gm. Found in 100 c.c.)	Percentage of U. S. P. Standard.
1. Frank S. Betz Co.	50	2.10	105
2. The Columbus Pharmacal Co.	52	2.08	104
3. Flint, Eaton & Co.	60	2.15	107.5
4. Eli Lilly & Co.	46	1.64*	82
5. McCoy, Howe & Co.	66	2.01	100.5
6. H. K. Mulford Co.	50†	2.03	101.5
7. The National Drug Co.	54	2.70	135
8. The Norwich Pharmacal Co.	47	2.06	103
9. Parke, Davis & Co.	47	2.07	103.5
10. Pitman-Myers & Co.	43†	1.92	96
12. A. E. Remick Pharmacal Co.	40†	1.81	90.5
13. Schieffelin & Co.	50	2.12	106
14. The O. F. Schmid Chemical Co.	50	1.68	84
15. Sharp & Dohme	47	2.39	119.5
16. Sutliff & Case Co.	‡	2.04	102
17. The Toledo Pharmacal Co.	46†	2.70	135
18. Truax, Greene & Co.	57	2.19	109.5
19. The William A Webster Co.	47	2.52	126
20. The Zemmer Co.	‡	1.71	85.5

* This specimen was assayed in triplicate. The results were 1.61, 1.69 and 1.63 gm. hydrastin per hundred c.c. In the last assay after the two prescribed shakings with ether had been made a third and a fourth shaking were carried out and the residues weighed separately. The total increase was but 0.03 gm. of hydrastin per hundred c.c., showing that the extraction as directed by the U. S. P. was practically complete.

† Maximum; ‡ Not declared.

Again the products of the "pharmaceutical houses" vary somewhat less than those of the "physicians' supply houses" and, as was found before, the price does not indicate quality, as the lowest in arsenic content was next to the highest in price. While in ordering these preparations the official title "Solution of Potassium Arsenite" was used, the product sent by Parke, Davis & Co. was labeled "Concentrated Fowler's Solution (without Lavender) for Preparing Fowler's Solution," and was stated to be eight times the strength of the official solution. The preparation sent by Pitman-Myers Company was labeled "Veterinary Solution, Potassium Arsenite P-M Co." Table 4 gives the results obtained.

OXIDE OF ZINC OINTMENT

Oxid of zinc ointment or, as it is commonly known, zinc ointment, like most other ointments, requires some skill to make it. Like most other ointments it is prone to deteriorate and when marketed is likely either to show signs of deterioration—rancidity of the ointment base or separation of the solid material from the fat—or else to have been rendered more permanent by departing from the official formula. The specimens purchased were therefore examined, first to determine whether or not they had been made according to the U. S. P. formula for zinc oxid ointment, and if not, whether or not a proper declaration of the fact was made on the labels. Second, the physical character was noted to determine whether or not the ointments were satisfactory preparations, that is, well-made ointments.

Of the fifteen preparations obtained from the "physicians' supply houses" five were made with the U. S. P. base, while the remaining, by such terms as "special," "improved," etc., were acknowledged to have been made with an unofficial base, generally petrolatum. In the case of the products obtained from the "regular" houses, four were declared to be made with the U. S. P. base. In the case of one specimen, that of Sharp & Dohme, departure from the U. S. P. formula was acknowledged, or at least hinted at by the statement that it was "Strength of Unguentum Zinci Oxidi, U. S. P." This specimen was found to contain, besides the required amount of zinc oxid, about 20 per cent. of corn-starch. As to the physical appearance of the ointment as obtained from the two classes of houses, those from the "regular" pharmaceutical houses were the best, in spite of the fact that the less stable U. S. P. base was present in three specimens out of the five. About five of the others approached these very closely while the remaining five were more or less markedly inferior products, despite the fact that only one-half were made with the U. S. P. base.

TABLE 4.—ANALYSES OF SPECIMENS OF FOWLER'S SOLUTION

Firm	Percentage Arsenic Trioxid Claimed, Per Cent.	Percentage Arsenic Trioxid Found, Per Cent.	Arsenic Trioxid Percentage of Claim, Per Cent.
1. Frank S. Betz Co....	1	0.905	90.50
2. The Columbus Pharmacal Co	1	1.039	103.9
3. Flint, Eaton & Co...........	1	0.990	99.0
4. Eli Lilly & Co...............	1	1.022	102.2
5. McCoy, Howe Co...........	1	1.002	100.2
6. H. K. Mulford Co...........	1	0.971	97.1
8. The Norwich Pharmacal Co..	1	0.968	96.8
9. Parke, Davis & Co. (labeled "Concentrated Fowler's Solution")	8	7.733	96.7
10. Pitman-Myers Co..........	1	0.833	83.3
11. The Ray Chemical Co........	1	0.873	87.3
12. A. E. Remick Pharmacal Co.	1	0.804	80.4
13. Schieffelin & Co............	1	0.975	97.5
14. The O. F. Schmid Chemical Co.	1	0.846	84.6
15. Sharp & Dohme............	1	0.975	97.5
16. Sutliff & Case Co..........	1	1.002	100.2
17. The Toledo Pharmacal Co...	1	0.900	90.0
18. Truax, Greene & Co..	1	0.899	89.9
19. The William A. Webster Co...	1	0.921	92.1
20. The Zemmer Co............	1	0.885	88.5

The United States Pharmacopeia (VII) assay method for Liquor Potassi Arsenitis was used in making these determinations.

The determination of zinc oxid[4] content denoted some variations from the required 20 per cent. standard; but in no case was the variation sufficient to warrant a charge of adulteration in any specimen.

The examination of zinc oxid ointment clearly points to the need of extemporaneous preparation by the retail pharmacist of preparations of this sort which are prone to deteriorate with age, particularly when exposed to changes in temperature such as are most likely to occur during transportation from the manufacturer to the jobber, the druggist or the physician.

FLUIDEXTRACT OF DIGITALIS

In view of the publicity which has been given the variability of digitalis preparations and because it is well known that a fluidextract of digitalis representing the

TABLE 5.—ACTIVITY OF FLUIDEXTRACTS OF DIGITALIS IN MILLIGRAMS PER KILOGRAM OF CAT

Firm.	Mg. Drug per Kg. Cat.* Mg.	Average. Mg.	Percentage Strength.† Per Cent.
1. F. S. Betz Co............	178 164	... 171	.... 46.17
2. The Columbus Pharmacal Co.	115 126	... 120	.... 65.83
3. Flint, Eaton & Co..........	200 157	... 178	.... 44.38
4. Eli Lilly & Co............	200 176	... 188	.... 42.02
5. McCoy, Howe Co..........	119‡ 111‡ 111‡	... 114 ...	.... 69.29 ....
6. H. K. Mulford Co..........	88 71	... 79	.... 100.00
7. The National Drug Co.....	193 145 160	... 166 ...	.... 47.58 ....
8. The Norwich Pharmacal Co.	158 200	... 179	.... 44.13
9. Parke, Davis & Co........	119 157	... 137	.... 57.66
10. Pitman-Myers Co..........	282 200 184 297	... 240	.... 32.92 ....
11. Ray Chemical Co.........	260 280	... 270	.... 29.25
12. A. E. Remick Pharmacal Co.	180 195 182	... 186 ...	.... 42.57 ....
14. The O. F. Schmid Chem. Co.	141 147	... 144	.... 54.86
15. Sharp & Dohme...........	136 139 144	... 140 ...	.... 56.43 ....
16. Sutliff & Case Co.........	276 249	... 262	.... 29.70
17. The Toledo Pharmacal Co..	155 184	... 169	.... 46.74
18. Truax, Greene & Co.......	166‡ 157‡ 196‡	... 155 ...	.... 50.97 ....
19. The William A. Webster Co.	172 160 196	... 176 ...	.... 44.88 ....
20. The Zemmer Co..........	216 286	... 251	.... 31.47

The average of the preparations of the "physicians' supply houses" is 197 mg. per kilogram of cat.

The average of the preparations of the "regular' pharmaceutical houses is 136 mg. per kilogram of cat.

Four c.c. of each of Nos. 1, 2, 3, 7, 8, 10, 11, 12, 14, 16, 17, 19 and 20 were taken, mixed and diluted with 5 per cent. alcohol and enough normal salt solution to make each cubic centimeter represent 20 mg., and this was tested on cats in the same way. The results of three tests were 187, 156 and 241 mg., an average of 195 mg. per kilogram.

* The figures in this column show the milligrams of drug represented by the volume of the preparation taken required for 1 kg. cat to produce death.

† The figures in this column were obtained by calculation from the values "Mg. Drug per Kg. Cat," taking the strongest preparation as 100.

‡ Tincture.

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[4] While, with the exception of the Sharp & Dohme product, the non-fatty constituent in each case was found to be only zinc oxid, the estimations of the zinc content were unsatisfactory. Two methods were employed: (a) direct ignition and weighing of the residual zinc oxid, and (b) extraction of an ether solution of the ointment with dilute hydrochloric acid, evaporation of the acid precipitation of the zinc as basic zinc carbonate and ignition to zinc oxid. The results obtained by these methods, while permitting conclusions of variability given above, are not entirely free from error and hence are not reported.

full strength of the drug is difficult to prepare, this examination was made to include fluidextract of digitalis. The results of an examination promised to be the more interesting because the firms which supply the drug trade have laid much stress on the quality of their products, which are claimed to be physiologically assayed. The smaller houses, on the other hand, unless they purchase their supply elsewhere, may be assumed not to standardize their digitalis preparations. Accordingly fluidextract of digitalis was ordered from the "physicians' supply houses" included in the list and also from four pharmaceutical firms. While all of these firms agreed to furnish fluidextract of digitalis, and while in each case fluidextract of digitalis was the item set down in the invoice, in two cases the preparations sent were labeled "Tincture Digitalis, U. S. P." While they were examined and are included in the list, it should be borne in mind that a reliable tincture is more easily made.

The examination of the digitalis preparations was made in the Loomis laboratory of Cornell University, under the direction of Dr. R. A. Hatcher, the "cat method" of Hatcher being used for the tests. Table 5 gives the results obtained.

The demonstrations represented in Table 5 were made with the understanding that exactness was not necessary, it being desired to know whether or not the specimens represented a good quality of digitalis. When such enormous variations in activity are dealt with as are shown between the several specimens it matters little whether or not a very exact figure for any one preparation is determined, and hence the results reported are sufficiently exact.

The table confirms the generally held belief that commercial digitalis preparations vary most widely, for it is seen that the H. K. Mulford preparation, the most active, is four times as active as the weakest, that of the Ray Chemical Company. Even the four preparations of the pharmaceutical firms, which may be assumed to have been checked by physiologic assay, show a variation of more than 100 per cent. in strength. The activity of these specimens is such that only the fluidextract of the Columbus Pharmacal Company and of the H. K. Mulford Company fully represent a digitalis of good quality.

While the products of the four "regular" pharmaceutical houses (Eli Lilly & Co., H. K. Mulford Company, Parke, Davis & Co., and Sharp & Dohme) show a wide variation, the product of Eli Lilly & Co. having only 42 per cent. of the strength of the Mulford preparation, the products of the "physicians' supply houses" show a lower and still wider range of strength. Here the strongest fluidextract has a strength of 65 per cent. of the Mulford product, while the lowest has a strength of but 29 per cent. Since there is no official standard for digitalis preparations, and in view of the fact that the physiologic methods employed by pharmaceutical houses are in general claimed only to guarantee uniformity for the product of a particular firm, no sharp conclusion can be drawn from this investigation. It does show, however, that in general the products of the "physicians' supply houses" are less active than those obtained from the pharmaceutical firms.

CONCLUSIONS

Although the examinations reported in the preceding do not cover a wide field, they are sufficient to show that the random charge of sophistication and adulteration which has been repeatedly made against "physicians' supply houses" is unjustified. It shows, on the contrary, that, as has been argued before, standard drugs are likely to be of fair quality. On the other hand, the examination does show that the products put out by this class of firms, *without* being sold at a materially lower price, are less reliable as regards uniformity than those of the pharmaceutical houses. In other words, while "physicians' supply houses" do not deliberately adulterate or sophisticate their standard drugs, their products are evidently produced by those who are less competent and less skilled than are those of the "regular" pharmaceutical houses.

A discussion of the products of pharmaceutical houses would be incomplete without reference to what appears to be the highest aspiration of pharmaceutical manufacturers, namely: a long list of "specialties" and "elegant pharmaceuticals." When one compares this class of preparations as put out by the two classes of firms one is struck with the fact that the specialties of the "physicians' supply houses" are a little more unscientific, a little more devised to mislead or cheat the user, are a little more brazen in their imitation of fraudulent and worthless proprietaries and more deliberately aimed to satisfy the unthinking physicians than are those of the "regular" pharmaceutical manufacturers.

While the specialties of the "physicians' supply houses" do not differ radically from the specialties sold by the "regular" pharmaceutical houses, their use is more likely to be uncritical. For this reason they are a constant invitation to the dispensing doctor to shirk the expenses of keeping in stock and the labor of selecting the medicines which his patient should have, and instead to treat all diseases with a few of the "shotgun" prescriptions which he may have bought.

535 North Dearborn Street.

ABSTRACT OF DISCUSSION

DR. B. FANTUS, Chicago: The report of Professor Puckner shows how valuable the work of the Council on Chemistry and Pharmacy is. It seems to be maid-of-all work. It shows, too, how absolutely fair the Council is in its reports. As there is a danger, perhaps, that this assembly might be taken to be in favor of dispensing by physicians, I offer the following resolutions for your consideration:

WHEREAS, Dispensing by physicians is liable to lead to inadequate medication by restricting the practitioner to a generally very limited stock of drugs; and

WHEREAS, The physician, unless he be also a pharmacist, is not qualified by training or experience to judge of the purity and strength of the drugs he dispenses, or to take care of their proper preservation, or to prepare them for that form of administration most suitable for the patient's needs, making individualization in treatment impossible; and

WHEREAS, The public is insufficiently safeguarded against dangerous and even fatal mistakes, when only one mind and hand stands between the poison and the patient, therefore be it

Resolved, That the American Medical Association advise its members against dispensing, excepting in cases of emergency or when the services of a properly qualified pharmacist are not available.

DR. RAY L. WILBUR, San Francisco: We could not as a section put ourselves on public record as favoring this resolution. We could only recommend it to the House of Delegates for their action.

DR. M. I. WILBERT, Washington, D. C.: Substantially the same suggestion as Dr. Fantus proposes is made in the Code of Ethics adopted by the American Medical Association at Atlantic City last year and embodied in the "Principles of Medical Ethics."

DR. RALPH ST. J. PERRY, Farmington, Minn.: In order to aid discussion I second the motion.

Dr. Alexander S. von Mansfelde, Ashland, Neb.: I am sorry the gentleman seconded the motion. We know how very little we know; let us not publish the fact to the world at large. I warn the gentleman that unless he withdraws his second I will move the laying of that motion on the table, because it is injudicious.

Dr. Ralph St. J. Perry, Farmington, Minn.: I am glad that I seconded that motion; otherwise we should not have had that open confession. I withdraw my second. This subject has been discussed in *The Western Druggist* and *N. A. R. D. Notes;* the journals have been rampant on the question of double standards of the drugs put up by the manufacturing pharmacists, asserting that they put up one grade to supply the dispensing doctor and another to supply the pharmacist. When I go to the editor and say, "I am a dispensing doctor and I want to know the manufacturer who puts up two grades, one for the dispensing doctor, an inferior grade, and another for the pharmacist, a superior grade; tell me which one of the manufacturing firms puts out the poor quality of drugs for the physician and which puts out the standard stock for the druggist," not one of them will give names. Professor Remington and others of the older members will recall that that same question relating to quinin pills was raised years ago. The societies and journals were burdened with papers detailing the differences in strength in various quinin pills and these shortages were represented by giving figures for the firms manufacturing the pills. There was not one analyst who had backbone enough to give the names of the firms. Professor Puckner has shown in The Journal that certain drug-houses are manufacturing drugs which are not up to the proper strength. Now when Professor Puckner publishes these statements we should like to have him name the man. He gave two or three instances in which the drugs ran below the standard. He did not say whether that was a sporadic or a chronic accident. Was more than one test of the same product made? I want to know whether the low standard was an occasional or a constant condition.

Dr. F. J. Wulling, Minneapolis: This question of inferiority of tablets and pills is as old as the hills. The question that we should concern ourselves with is: Are things getting better or are they at a standstill? Are drugs of to-day more reliable, more efficient than they were ten or twenty years ago? If so, conditions are getting better; if not, something should be done, and a body like this should see that standards are laid down and then observed. Has Professor Puckner noticed improvements?

Prof. W. A. Puckner, Chicago: I have given only an abstract of the work, and when the entire report is published the source of each drug examined will be given. Whether or not the variation is sporadic I am unable to say at this time. The work was taken up because of the insistence on the pharmaceutical press during the last year of the utter worthlessness of the drugs supplied to physicians by supply houses. The examination was based on a single specimen bought from the firm. It may have been an accident. The particular case of fluid hydrastis surprised me as being below standard, inasmuch as it was the product of a manufacturing house that is generally believed to stand high. I was informed by Professor Clark of the Illinois School of Pharmacy that he also had examined a specimen and found it of distinctly inferior quality. It is quite likely that he obtained a sample from the same barrel my sample came from. I believe that the reports from the chemical laboratory have done something in the direction of improvement. It is to the credit of no firm to be found wanting and it will, no doubt, cost a firm a good deal in loss of prestige to have its products found inferior. I believe that no firm has deliberately adulterated. The amount of money to be gained in that way is insufficient. Standard drugs have improved decidedly. On the other hand, some work done in the laboratory with complex mixtures—things which were utterly worthless anyhow—has been published of late, including a third examination of a certain tablet, the investigation covering three years. These firms have done practically nothing to improve their products, evidently thinking that any physician who is fool enough to prescribe such mixtures does not deserve to get good drugs. The same I think can safely be said also of the worthless drugs supplied to the physician who prescribes them. He is not competent to know the difference and he does not care, and the pharmacist does not care either. I think that the high-grade drugs have improved decidedly.

SYPHILIS AND THE NERVOUS SYSTEM*

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If all that has been written on the subject of syphilis were collected and made readily accessible a lifetime would probably be too short in which to peruse it. What excuse have I then for adding to it? Have I something to say that will add to the sum total of our knowledge of it, and which shared with you will combat the disease more successfully? I have definite views concerning the treatment of syphilis based on a very large experience with the important clinical display of syphilis, that of the nervous system, which are not generally accepted, but which should be accepted that syphilis may be successfully treated. I do not mean to say that these views are original, for I know that they are taught by many progressive syphilologists. They are not held by the rank and file of the profession, however, if I may judge from an extensive contact with them.

The treatment of syphilis has entered a new era; first, because we have a test for its detection and, second, because we have had added to our means of combating it a curative agency that equals and probably exceeds mercury. Although skeletal and visceral syphilis are not so flagrant in their display as they were a hundred or even fifty years ago, because of the universal conformity to most of the laws of hygiene, syphilis is still a scourge and a pestilence, a menace to the health and efficiency of every nation.

Fortunately we need not concern ourselves with the origin of syphilis. Each European nation accused the other in turn of carrying the disease to its shores and all accused America. What we really know about it is that Girolamo Fracastorio (1483-1553), a Veronese physician and poet, gave it the name and described its origin, course and treatment in hexameter verse. The hero of the poem, a shepherd, Syphilus by name, in the employ of King Alcithous, has blasphemed the Sun and this deity in a moment of wrath strikes him with the disease of which Venus has had a monopoly in modern times:

> A Shepherd once (distrust not ancient Fame)
> Possessed these Downs and Syphilus his Name,
> A thousand heifers in these Vales he fed,
> A thousand Ewes to those fair Rivers led.

He is cured of the disease by the nymph Americi (America) who administers guaiacum. This poem, which deserves to be read even to-day, is apparently well-nigh forgotten save by a few litterateurs and physicians. A translation of it is to be found in the third part of Dryden's "Miscellany." The poem seems indeed to have been widely read and to have been given serious consideration. The worst that can be said of it, comments Professor Saintsbury, is that it could have been done much better in prose a criticism that may be made with even greater justice of much modern English poetry—"The Widow in the Bye Street," for instance.

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* The oration in medicine before the Illinois State Medical Society held in Peoria, Ill., May 22, 1913.

The disease presented itself to Fracastorio and his contemporaries as a terrible epidemic quite independent of its occurrence from individual misconduct. It is for this reason that he and his literary successors were able to treat it in an impersonal way much as they might treat small-pox or scarlatina. No odium of profound and disgusting personal immorality attached to its possession such as is attached to it to-day.

When it began to be realized that syphilis was a disease that had its origin in sin and its cause in what we are pleased to call immorality, then it became a tabooed subject. No newspaper dared print the word, it was never heard save in medical discussion, and even daring social workers in the field of hygiene usually felt obliged to speak of it as lues, which only the more sophisticated of their auditors understood at once, or, if they desired to be still more refined, as the Fracastorian malady. Two years ago Harvard University announced a series of twenty lectures to be delivered in "popular" style for the edification and benefit of the public. Among them was one on syphilis. It is said that no newspaper in the town which the Brahmins love to have called the Athens of America dared print the name of the most unmentionable of all subjects. Now all this is changed and Brieux, a litterateur long without honor in his own country, though now a member of the French Academy, did it. He wrote a dramatic piece called *Les Avariés*—"Damaged Goods." Before the play begins the manager appears on the stage and says, "Ladies and Gentlemen: I beg leave to inform you that the object of this play is a study of syphilis in its bearing on marriage." Then the actors and actresses proceed to give the most meticulous account of its diagnosis, the culpability of the husband, the infection of the wife, the transmission to the infant, the inoculation of the wet-nurse and so on. This play ran in New York for two months or more a short time ago, and I have heard temperate, conventional individuals say that they thought it should be given at Vassar, at Smith and at Bryn Mawr colleges. Be that as it may, the taboo has been removed, and, although we probably shall not hear syphilis discussed at the dinner table, as we do most human ills, and with avidity if they happen to be surgical, there is no doubt that it will be considered good form to instruct the laity, plainly and openly, concerning the disease and its capacity to bring incomparable misery to its victims.

But in addition to instruction of the laity, our medical students must be properly instructed. It is safe to say that in no medical college or university of this country is the subject of syphilis properly or adequately taught. In every instance it is included under the caption of dermatology or genito-urinary diseases. It has comparatively small relationship to the former and practically none to the latter. The subject of syphilis properly taught must be done by the general clinician and internist who may also be dermatologist, neurologist or even ophthalmologist, but he will never grasp the problem of syphilis unless he knows it as it affects all the organs and tissues of the body.

Syphilis is a disease due to the infection of the body by a thin, spiral organism called *Spirochaeta pallida*, whose cycle of development has not yet been satisfactorily established. Very little indeed is known of its life history. It may or may not produce what is called a characteristic lesion at the point of inoculation, namely, the Hunterian chancre. Certain it is that many physicians still believe that it is necessary that a chancre with indurated base and other so-called characteristic features must exist if the individual becomes inoculated with syphilis. This is a pernicious belief. Inoculation with syphilis need not and often does not cause a "characteristic" lesion. It is well known that a certain time elapses between inoculation and systemic infection, a variable one. When it enters the vessels and the lymphatics its choice is apparently the walls of the lymphatics, from which it enters the intercellular spaces of the tissues. It is found especially with mononuclear infiltration, and Metchnikoff believes that it exerts a chemotactic influence on those cells.

The prevention of syphilis is in reality one of the most urgent and important problems, from a hygienic and economic point of view, that the physician can set himself. It is a subject to which many earnest men and women are devoting their energy. Their efforts must be barren until the light of popular education or of enlightenment bathes the subject. This aspect of the subject cannot be considered here. It is the syphilitic diseases of the nervous system to which I invite attention. *There are diseases of the brain and spinal cord, their coverings, linings and blood-vessels that are caused solely by syphilis.* They constitute the bulk of all organic nervous diseases. These diseases are tabes, paresis, certain forms of myelitis and softening of the brain and spinal cord, meningitis, endarteritis and gummatous formation constituting tumor. Each of them, it matters not what the seat or extent of the morbid process, causes symptoms which taken together constitute well-defined clinical entities, and as such may be diagnosticated with readiness and certainty. Many other disorders of the nervous system and especially functional ones, neurasthenia, headache, states of unattributable depression have, since the introduction of a positive test for the existence of syphilis, been shown to be dependent on this infection.

Not so many years ago it was taught that involvement of the nervous system was a late manifestation of syphilis. Now we know that this is not so. I shall not detain you with statistics to uphold these statements but they have been published by myself and many others. Nervous diseases, to be sure, do not occur during what is often called the florid stage of syphilis, that is, during the time that the mucous membrane and cutaneous manifestations usually occur. It is during this period however that the parasite invades the lymph-spaces and channels of the nervous system and begins the warfare which for years may be so silent and its conduct so insidious that the victim remains unconscious of it. The most serious of the organic diseases of the nervous system, encephalitis, myelitis, cerebral and spinal endarteritis, may occur during the first months of the syphilitic infection, and diseases such as tabes and general paresis, which are exclusively syphilitic in their causation, may and often do display their initial symptom within five years after the date of infection. If you turn to your text-books and encyclopedias of medicine you will find that tabes and general paresis are referred to as parasyphilitic or metasyphilitic diseases, and nearly every author will discuss the probability that there is some other cause than syphilis for these diseases. But the day of such designation has passed. Tabes and general paresis are syphilitic diseases and the dictum that syphilis produces a "characteristic" inflammatory reaction, namely, the granuloma must be given up. Before we had a reliable test for syphilis and before we had given a specific valuation to the information obtained from study of cerebrospinal fluid, we were obliged to use such terms as parasyphilis (which means pertaining in an indirect or remote way to syphilis) or metasyphilis (transformed from syphilis) because all pathologists were agreed that the syphilitic pathologic change is a characteristic one. The lesion of tabes and of general paresis is as far removed from the "characteristic" as can possibly be and now that Noguchi and Moore have demonstrated the existence of the *Spirochaeta pallida* in the lesion of general paresis it will have to be admitted that such lesion is syphilitic. Indeed, the conception of parasyphilitic disease and metasyphilitic disease, namely, that the syphilitic virus underwent some transformation before it caused the tabes or general paresis, has been a menace to the successful treatment of these diseases, for how could one justify himself in giving antisyphilitic treatment if the *de facto* determining cause was not the syphilitic poison acting as such? I believe that nothing has done so much to stultify our efforts in the treatment of syphilis and syphilitic organic nervous diseases as the sort of rule of thumb which called for the giving of mercury in the second stage, potassium iodid in the third. For the most common of all diseases that flow out of syphilis, organic nervous diseases were considered to be tertiary manifestations of the disease and were therefore often never given a real antisyphilitic. It will advance the treatment of syphilitic diseases of the nervous system if we now and for all time give up the designations "parasyphilitic," "metasyphilitic," "tertiary syphilis" and the like. Syphilis is syphilis just as indisputably as a good cigar is a smoke, and it matters not when or under what veil it is encountered.

The measures that permit us to say thus positively that syphilis is syphilis at all times are popularly known as the Wassermann test of the serum of the blood, of the cerebrospinal fluid and its various modifications (the so-called Stern's method, Hecht's method, Noguchi's method) and the cytologic examination of the cerebrospinal fluid. The Wassermann reaction has been described many times since the discovery of the Bordet-Gengou phenomenon in 1901 on which it is based. Without entering here into a discussion of the nature of the reaction, it must be granted that clinically the test with but very few exceptions is pathognomonic of syphilis. It is highly probable that the reaction is not strictly specific, that the substance produced in the infected individual is not a true antibody, and that the so-called antigen is not a true antigen.

The specificity of the reaction is a most important matter. That a positive reaction follows in conditions other than syphilis is certain, but aside from such diseases as yaws, leprosy and trypanosomiasis, a positive Wassermann reaction is rarely obtained. Hoehne found a positive reaction but twice in the examination of 1,100 serums taken from healthy persons or from persons suffering with other diseases than syphilis and in neither of these two could syphilis be excluded. McDonagh, Mueller and Morawitz in reporting on 5,000 cases did not obtain a single positive result in any case from which syphilis could be excluded.

Since the opening of the Neurological Institute in New York, a hospital devoted exclusively to the study and treatment of nervous and mental diseases, the Wassermann reaction has been done by Dr. D. M. Kaplan, director of the clinical laboratory, upward of 10,000 times. Of these 10,000 analyses undertaken in the great variety of diseases that come to a hospital for nervous diseases, a considerable proportion of which are metabolic and visceral, about 28 per cent. have shown a positive Wassermann reaction. In practically all of these the Wassermann reaction of the serum and the evidences of syphilis in the cerebrospinal fluid were corroborative of the clinical findings. In view of the complexity of the reaction we never felt justified in pronouncing a case one of syphilis unless we had clinical corroboration.

The cerebrospinal fluid, which is secreted to the amount of about 150 c.c. a day by the chorioid fringes, is a pale, colorless liquid containing no cellular element except a few large endothelial cells and an occasional lymphocyte. On being heated, it becomes slightly clouded; this is due to a proteid called globulin. Traces of dextrose are found. Study of this fluid taken from patients suffering from organic disease of the nervous system, and especially from those that flow out of syphilis, shows that this fluid is altered in a way that is highly characteristic, indeed almost pathognomonic and which may be utilized for diagnostication.

In the first place, in all syphilitic diseases of the central nervous system the reaction of the cerebrospinal fluid to the Wassermann test is plus in the vast majority of instances, unless the disease has been influenced by treatment. It need not be plus, however, for a negative Wassermann reaction of this fluid does not necessarily speak against the existence of any of these diseases, especially if the cell-content, the proteid or the glucose is in excess. In all syphilitic diseases of the central nervous system the lymphocytes are increased to a variable extent from ten to a thousand or more to each cubic millimeter. The mononuclear elements predominate. The globulin is increased, the dextrose, which is normally present, may in very acute meningeal irritations be absent. From an examination of over 3,000 cerebrospinal fluids, Dr. Kaplan and myself have come to conclude that the formulary of Table 1 expresses approximately the alteration in the serum and in the fluid in tabes, general paresis and cerebrospinal syphilis:

TABLE 1.—SERUM AND FLUID ALTERATIONS

	Blood Wassermann	Cerebrospinal Fluid Wassermann	Cells	Globulin Excess	Fehling's Reduction
Tabes	+ as a rule; occasionally —.	+ or —	numerous 20-100 or more	+ or —	+
General paresis.	+ ; rarely —	+	few 5-30	+	+
Cerebrospinal syphilis.	+	+	large number 100-1500	+	+

The treatment of syphilis by the rank and file of the profession of the present day consists in the administration of mercury by the mouth, usually in the form of the protiodid, kept up for a year, followed by the administration of mercury and iodid mixed in solution and kept up for another year, followed finally by the administration of potassium iodid alone in doses ranging from 10 to 60 grains or possibly even more, depending on whether or not there are any so-called "evidences" of syphilis. The patient then maintaining that he feels well or fairly well and having no outward manifestations of the disease is told that he is cured, that he may marry and procreate and that the disease is a thing of the past. I do not intend to say that there are not hundreds of patients afflicted with syphilis who are being treated otherwise than in this way. Unquestionably in every considerable city of the country and probably in many towns the diagnosis of syphilis is being made by the detection of the spirochetes, the infection of the blood is determined by the Wassermann reaction, and mercury and salvarsan are being given appropriately and the results of their action determined not alone by the disappearance of the clinical evidence of the disease but by a cessation of a positive Wassermann reaction in the serum of the blood. But I believe that for one case dealt with in this fashion, there are a score that are dealt with in the former fashion.

Now, this statement requires a discussion of five topics:

1. Is syphilis ever a local disease and is its only locus a true or Hunterian chancre?
2. Is the administration of mercury by the mouth a competent way of getting sufficient mercury into the system to kill the spirochetes in their *lymphatic invasion?*
3. Is potassium iodid in any way, shape or form a spirochetacide and therefore a true antisyphilitic agency?
4. What is the clinical value of the Wassermann reaction?
5. Is salvarsan or neosalvarsan an antisyphilitic remedy comparable in its efficiency with or greater than mercury?

My reply to the first question must be an expression of individual belief reflecting the opinion of such a competent authority as Fordyce. Unquestionably a variable period elapses between the time of inoculation and the time when the clinical evidences of syphilis display themselves in any of the tissues of the body. Likewise the Wassermann reaction of the serum of the blood is not positive in individuals infected with syphilis until after a period of from days to weeks following the infection. At one time it was the accepted teaching that during this period no constitutional treatment looking to the destruction of the syphilitic virus should be administered. Regrettably there is much teaching of this kind even to-day. Indeed, until recently it has been taught and to-day it is very widely believed that the syphilitic infection has its point of entrance only in the Hunterian chancre; that the chancroid and the herpes patch and the abrasion are never the point of entrance of the spirochetes. It has been amply demonstrated by inoculation experiments in animals that the system may be infected by the spirochetes without producing a so-called typical induration; and there is abundant, convincing evidence to show that the site of the inoculation in many instances in man displays only a "non-typical" ulceration. The fact that there is neither clinical nor serologic detectable evidence of infection does not means that such infection does not exist. There is a period of incubation in every infectious and protozoal disease. During this period of incubation the vital resistance of the protective tissues of the body is being overcome. Often, however, the evidences of infection are not to be found during this period in the tissues nor do they display themselves clinically; it still does not follow that the infection does not exist. It is not unlikely that one of the most important steps in our progress in treating syphilis adequately is to apply the spirochetacide, salvarsan or mercury, during this period of the disease. Success is much more likely to attend an attempt at destruction of the enemy's army if it is vigorously and overwhelmingly attacked during transportation and mobilization than if such action is delayed until it is securely mobilized and entrenched.

The reply to the second question that we have put to ourselves is not an easy one. Individually, I can answer it readily and to myself satisfactorily: The administration of mercury by the mouth is not an adequate and satisfactory way of administering the remedy. My opinion, however, may be biased by my experience, especially by my experience as a neurologist. Practically all the patients that I have seen with diseases having their origin in syphilis have been thus treated, and such experience gives me a conscious and unconscious prejudice against such mode of medication. Indeed, some years ago I published very considerable statistics which seemed to show that persons who had syphilis and who had been treated for it in the orthodox way (that is the way described above) developed nervous diseases that flow out of syphilis as soon after infection and as severely as those who had little or no treatment. This could be interpreted only as meaning that the orthodox treatment was as little efficacious in preventing certain syphilitic diseases as no medication at all. And this is my belief at the present time.

In opposition to this many will cite their own experience, which is that they have treated scores of cases of syphilis in the orthodox way and the patient has remained cured. Such antagonists will have greater difficulty, however, in maintaining their position than I. In the first place, once they know, and knowing believe, that the vast majority of organic affections of the central nervous system and its coverings are syphilitic diseases and that a very much greater proportion of cardiovascular diseases are syphilitic than were formerly believed to be, their verdict is contrary to the evidence. In the second place, unless they are in a position to know what has become of their syphilitic patients ten, twenty and thirty years after they have been under treatment, and of their descendants, their experience does not entitle them to give testimony. There can be no doubt that many cases of syphilis, possibly the majority, terminate in complete recovery while under such medication, but this cannot be construed as proof that the treatment cures the disease. It is more probable that the combative power of the protective tissues of the body is sufficient to overcome syphilis without aid in many instances. Moreover, there is always a tendency, in syphilis which has been treated, for the symptoms to disappear spontaneously, only to recur later. It is more than likely that there are definite strains or varieties of the *Spirochaeta pallida,* that there may be one strain that has a predilection for lodging in the lymph-spaces and channels of the central nervous system and another that has a sort of chemotaxis for the vascular system and for the skin. We have no means of proving at the present time that this is so, but it can scarcely be a coincidence that so many of the patients that come to me with syphilitic nervous diseases have been told by the physicians who treated them that they had very light attacks. One may have a light attack of diphtheria or of typhoid and be the legitimate recipient of congratulations but to have a light attack of syphilis is comparable to having an introduction to the executioner a month or a year before being guillotined.

It would be interesting and extremely useful to know what proportion of syphilitics develop nervous diseases, but so far no statistics on this subject have been at all convincing. If we can devise some system for reporting syphilitic diseases in the way diphtheria is now reported, without betraying the identity of the sufferer, we shall be in a position to get such statistics within another generation; by that time it is to be devoutly hoped that syphilis will practically be conquered.

In a paper read before the New York State Medical Society in 1910,[1] I made the statement that there was little evidence to show that potassium iodid was a real antisyphilitic agency. So far as my knowledge goes no evidence has since then been adduced. Despite this it is no exaggeration to say that tons of potassium iodid are administered every year to patients suffering from syphilis. I may say without any exaggeration whatever that scarcely a patient comes to me, either in my private practice or in my service at the Neurological Institute, bearing a letter from his physician requesting counsel as to the nature and treatment of the patient's ailment, in which it is not set forth that the patient has been taking potassium iodid in varying doses of from twenty to several hundred grains often for a protracted time. We have not given an ounce of potassium iodid in the three and a half years that the Neurological Institute has been in existence. During that time I have personally seen, studied and treated upward of six thousand patients, many of them victims of advanced nervous disease, many of them victims of serious nervous diseases having their origin in syphilis. No attitude could be more divergent. Either there must be tangible proof that potassium iodid is useful in the treatment of syphilis *per se* or my position must be right. I do not deny that potassium iodid is an extremely useful agency in dissipating, disintegrating and absorbing certain pathologic tissues which are the result of the activity of the syphilitic virus. I likewise readily admit that in the treatment of the granulomas of late syphilis the iodids are of the greatest value in restoring patency to blood-vessels occluded by tissue which results from the activity of the syphilitic virus so that the active spirochetacide can reach the real disease and its cause.

In a peculiarly distressing book, recently published, entitled "The Private Life of Henry Maitland," in reality a meticulous statement of the moral infirmities of George Gissing, which justifies the saying "God save us from our friends," Morley Roberts, the shameless perpetrator of the work, in a desire for self-glorification, quotes a letter from Gissing to his physician:

> You remember that patch of skin disease on my forehead? Nothing would touch it; it had lasted for more than two years, and was steadily extending itself. At last a fortnight ago I was advised to try iodid of potassium. Result—perfect cure after week's treatment!

This is the sort of thing that potassium iodid does for the manifestations of syphilis, but it leaves the disease itself untouched.

Reduced to a few words my protest is against the use of potassium iodid as a routine measure in the treatment of syphilis, and particularly against reliance on it to check the activity of the *Spirochaeta pallida.* To hold that potassium iodid, because of this, is an antisyphilitic agency, seems an absurdity. An ant raises up an anthill and a mole causes a deformity of your lawn but, if these are leveled off you are likely to forget that the ant or the mole may still be at work underground.

THE CLINICAL AND THERAPEUTIC VALUE OF THE WASSERMANN REACTION

I assume that it is generally admitted that the Wassermann reaction alone of the blood-serum of an individual who has had syphilis is sufficient evidence of active infection to justify antisyphilitic treatment, even though no clinical evidences of syphilis exist. This reaction in the blood-serum and in the cerebrospinal fluid is quite sufficient to justify such treatment when disease of the nervous system is suspected, especially if there is a lymphocytosis of the cerebrospinal fluid, even though there is no definite symptom of nervous disease. On the other hand a negative reaction does not mean that syphilis has not been or is not the cause of the symptoms or disease that is being investigated. During the latent period of syphilis, that is, the period in which there is an equilibrium between the host and the parasite, the reaction is often negative, perhaps as often as 50 per cent. of the cause. This equilibrium may cease to exist any day; then the negative reaction will become positive. This was one of our most enigmatic experiences when we first began investigating the serology of nervous diseases. A succession of negative reactions must be obtained before syphilis can be excluded as the cause of any nervous disease. A single negative reaction means nothing. Moreover, a negative Wassermann reaction frequently becomes positive after one or two injections of salvarsan. The salvarsan has a precipitating or provocative effect, so to speak, on the reaction. It is supposed to be caused by the setting free of the endotoxins contained in the bodies of the spirochetes which have been destroyed by treatment or by other causes. It must never be forgotten, nor should we lose the opportunity to recall it to ourselves, that in certain ancient infections apparently no amount of salvarsan or mercury will bring about a condition in which the blood-serum gives constantly a negative reaction. This is the rift in the lute.

IS SALVARSAN OR NEOSALVARSAN AN ANTISYPHILITIC AGENCY COMPARABLE IN ITS EFFICIENCY TO MERCURY?

In attempting to answer question five of our series, it is assumed that mercury is a competent agency to overcome syphilis. Confronted with such an assumption, the question as to why the discovery of salvarsan and the claims made for its efficacy, were hailed with such delight, becomes pertinent. The reason is that it is impossible in many cases, and probably always difficult, to administer a sufficient amount of mercury to cure the disease. The plan of its administration taxes the victim's patience and the resourcefulness of the physician. Administered in the most efficacious way, by inunctions, it is profoundly offensive, to say the least. Administered in the next most efficacious way, that is, intramuscularly, it is frequently painful and occasionally accompanied by disagreeable consequences. Administered by the mouth it is unreliable and tedious. Finally, it matters not in what way it is administered, it is difficult in many instances, perhaps indeed in most, if we consider the fact that many of the victims of syphilis are not only youthful but constitutionally disinclined to take responsibility, to induce the patient to remain a sufficient length of time under treatment to effect cure of the disease. When, therefore, there came from a person and an institution of authority in 1910, the announcement that a remedy then called "606," now called salvarsan and neosalvarsan, a cure for syphilis had been discovered, a cure that would accomplish these results in a brief space of time, there was profound satisfaction throughout the civilized world. In the three years that have elapsed since the remedy has been generally used an enormous literature has been published for and against it. I shall make no attempt whatever to review this literature; first, because I am convinced that the time has not yet come to do so, and, in the second place, because for the results of *individual* experience carefully tabulated, criterions are still sadly wanting. *It is not sufficient*, in order that the therapeutic use of salvarsan may be established, to report only the scores of cases that have apparently been cured. It matters not what the syphilitic disease may be.

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[1] Collins, Joseph: Syphilitic Diseases of the Nervous System; Their Relationship to Inadequate and Improper Treatment of Syphilis.—The Journal A. M. A., April 23, 1910, p. 1349.

I began the use of salvarsan at the Neurological Institute in June, 1910, therefore have been using it about three years. During that time I have given it to upward of 250 patients suffering with syphilitic nervous disease. A report of 75 of these cases was published[2] and an estimate was then attempted of its value in syphilitic nervous disease. In that paper it was stated "that salvarsan had not replaced mercury, perhaps it never will. To-day these two agencies are used side by side, one often supplementary to the other. The therapeutic potentialities of salvarsan, however, are not yet fully shown. We are convinced that in the treatment of diseases of the nerves that flow out of syphilis, far better results attend the use of salvarsan than of mercury. Our added experience of the past year justifies us in repeating that statement. In order to show the results of treatment in syphilis of the nervous system, I have selected the last twenty-five cases of tabes and have tabulated the results in Table 2.

TABLE 2.—TABES DORSALIS

		Cerebrospinal Fluid				Doses			Cerebrospinal Fluid			
	Serum Wass.	Wass.	Cells	Glob.	Fehl.	No.	Gm.	Serum Wass.	Wass.	Cells	Glob.	Fehl.
1	+	+	209	+	+	2	0.6	+	+	133	—	+
2	+	—	273	+	+	2	0.6	+	—	11	—	+
3	+	+	135	+	+	1	0.6	—	—	25	—	+
4	+	—	33	—	+	4	0.6	—	—	35	—	+
5	—	—	33	—	+	1	0.6	—	—	9	—	+
6	—	—	61	—	+	4	0.6	—	—	13	—	+
7	—	—	53	—	+	4	0.6	—	—	0	—	+
8	+	+	6	—	+	4	0.3	—	—	0	—	+
9	+	—	2	—	+	3	0.6	+	—	4	—	+
10	+	+	96	+	+	3	0.3	—	+	15	+	+
11	—	—	54	+	+	3	0.6	+	—	34	+	+
12	+	+	50	+	+	2	0.6	—	—	21	—	+
13	+	+	137	+	+	3	0.6	—	—	0	—	+
14	+	+	94	—	+	9	0.6	+	—	36	—	+
15	+	+	131	+	+	4	0.3	+	+	160	+	+
16	—	—	42	—	+	4	0.6	—	—	0	—	+
17	+	+	90	+	+	4	0.6	—	—	17	—	+
18	—	—	142	—	+	5	0.6	—	—	48	—	+
19	+	+	110	—	+	3	0.6	+	+	31	—	+
20	+	—	94	+	+	2	0.6	+	+	91	+	+
21	+	+	94	+	+	2	0.6	+	+	68	—	+
22	+	—	253	+	+	1	0.6	+	—	59	+	+
23	—	+	33	—	+	3	0.6	—	—	25	—	+
24	+	—	273	+	+	2	0.6	+	—	11	—	+
25	+	+	128	+	+	1	0.6	—	—	60	—	+

SUMMARY

	Serum Wassermann.		Cerebrospinal Fluid				Globulin Excess.	
			Wassermann.		Lymphocytes.			
	Plus.	Neg.	Plus.	Neg.	Least No.	Greatest No.	Plus.	Neg.
Before	18	7	13	12	2	273	14	11
After	11	14	6	19	0	133	5	20

HOW SHALL SALVARSAN BE ADMINISTERED IN SYPHILITIC NERVOUS DISEASES?

Nothing could be more inimical to the establishment of the real worth of salvarsan than the impression or belief that was widely disseminated in the first months of its use that one or two or three doses of salvarsan cured syphilis. It is possible indeed that such administration may cure some cases of syphilis, but it is possible, indeed certain, that syphilis is a *self-eliminating* disease in many instances. Once the spirochetes have become entrenched in whatever part of the viscera they find warmest reception, from whence they cause structural disease, then it requires repeated doses of salvarsan to cure, if salvarsan cures at all. The longer we use it the more we become conversant with its therapeutic capabilities, the more convinced we are that the dose of salvarsan must be repeated, not once or twice or three times but perhaps twelve or twenty times, and that its action or its effect must be supplemented by the use of mercury.

The plan of treatment which we adopt at present is to administer four doses of neosalvarsan (to men 0.9 and to women 0.5 gm.) intravenously every fourth or fifth day for four doses. At the end of this time examination is made of their blood and cerebrospinal fluid. If a profound impression has been made on these tissues an interval of a month is allowed to elapse without further treatment. If it has not, the patient is put on large and increasing doses of mercury administered in one of two forms, either the salicylate from one-half to two-grain doses suspended in benzoinal and given intramuscularly, or the mercuric bichlorid from one-eighth to one-half grain combined with cocain and given intramuscularly every day or every second day; depending on effects. After the patient has been under such mercurial treatment for a period varying from three to four weeks, the laboratory examinations are repeated. We then determine from a consideration of the objective features of the disease, from the statement of the patient and from the laboratory findings, when the salvarsan shall be repeated. Usually the series is repeated within three months. This plan of treatment is adhered to till the evidences of syphilis in the serum and cerebrospinal fluid disappear.

It is my belief now as it has been formerly that such remote evidence of destruction of certain pathways in the central nervous system as the Argyll Robertson pupil, and the abolition of the tendon-jerks, do not disappear even though the disease be arrested, which it frequently is, unquestionably.

DANGER ATTENDING THE ADMINISTRATION OF SALVARSAN

The dangers of salvarsan administration have been exaggerated. In nearly 1,000 administrations we have seen serious consequences follow the use of the remedy in one instance only. The patient, a young woman who complained of weakness, nervousness and general inability to work and whose blood-serum was strongly positive, developed a few hours after 0.6 injection of salvarsan intravenously the symptoms of transverse myelitis. She recovered completely in four months. The lesion in that instance was probably of the nature of an edema of the cord rather than inflammation. Severe toxic effects of the drug we have seen in four instances. They are those characteristic of acute arsenical poisoning. In only one of these were the symptoms so acute as to give rise to apprehension. They were readily controlled by the free administration of magnesium carbonate and by the use of colon irrigation and hot baths. I have had no cases of blindness which at one time it was freely said salvarsan was likely to cause. Nor have I seen nephritis follow its administration. I do not hesitate to administer it in patients who have optic nerve involvement as a result of syphilis.

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[2] Collins, Joseph, and Armour, Robert G.: The Treatment of Syphilitic Diseases of the Nervous System by Salvarsan.—THE JOURNAL A. M. A., June 22, 1912, p. 1919.

THE EFFECTS OF SALVARSAN ADMINISTRATION

The immediate effects, that is within the twenty-four hours, are variable. Their occurrence depends in a measure on the preparation of the patient and the correctness of the technic of administration. When every precaution is taken some patients nevertheless have a rigor, slight rise of temperature, up to 100, and usually diarrhea within five hours after the salvarsan has been given. In one instance only have I seen a patient have a sense of cardiac oppression after the injection and I have never seen pain, headache or backache which was not more properly attributable to lumbar puncture.

The remote after-effects, that is, after a few days, is almost invariably a feeling of buoyancy, increase of weight, and what is meant by improvement of the general health.

The contra-indications to the use of salvarsan are nephritis and advanced nephritis and advanced arteriosclerosis.

All things considered the intravenous method of administration is preferable. Neosalvarsan has advantages over salvarsan insomuch as it is more easily soluble; it does not need to be neutralized; it is probably less toxic and it is simplicity itself to prepare (namely, mix it with 150 c.c. of sterile freshly distilled water). Despite these advantages my belief is that it is an antisyphilitic agency quite inferior to salvarsan and that the results we have obtained from the administration of neosalvarsan are not so good as those from salvarsan.

What then, finally, is my message? It is that syphilis is still a scourge to our people, hidden in the folds of the cloak of shame. Its occurrence must be checked by enlightening the people, men, women and youth. Its activity must be curtailed by prompt, vigorous and appropriate treatment. Its manifestations, it matters not in what tissues or organs they appear, constitute syphilis and it is this and not the disease of the organ or tissue that must be treated.

37 West Fifty-Fourth Street.

THE DEMONSTRATION OF THE SPIROCHAETA PALLIDA IN THE BRAIN SUBSTANCE OF LIVING PARETICS (FORSTER AND TOMASCZEWSKI)

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Following the demonstration by Noguchi of the *Spirochaeta pallida* in the stained specimens of the brain in general paralysis, Marie, Levaditi and Bauchowski[1] were able to demonstrate the organism from the fresh brain at necropsy by the dark field illumination. During the past month a cooperative finding of no less importance has been reported by E. Forster, assisted by E. Tomasczewski.[2] Employing the method of brain puncture, these authors have been able to demonstrate living spirochetes in the aspirated cortical substance. Their first report included six cases examined with positive findings in two. Twenty cases have been examined to July 28, and the organisms have been found in eight.

Through the kindness of Professor Forster I have been permitted to assist in two of these operations, to substantiate the microscopic findings, and to report herein the method of procedure.

The method of puncture is as follows: The patient's head is first shaved and the anterior portion of the skull thoroughly painted with tincture of iodin. The point of operation selected is over the frontal convolution from about ½ to 1 inch from the midline and well forward of the middle meningeal artery. The region is frozen with ethyl chlorid and a revolving dental drill is thrust quickly through the skin and deeper tissues. A few rapid revolutions of the drill in the hands of an assistant suffice to pierce the skull. The borer, or drill, is then removed and a long, thin trocar needle is inserted in the hole through the skin and bone; this is pushed firmly and deeply into the cortex. The wire obturator of the trocar is withdrawn and a syringe barrel is attached to the end of the needle. By suction, a small cylinder of brain substance containing both gray and white matter is drawn into the syringe, together with more or less fluid from the ventricle. This material, transferred to a sterile Petri dish, is examined at once with a dark field illumination. Thus far the organisms have been found in the gray matter only.

The operation is extremely simple. One has only to avoid the cerebral and meningeal vessels, and over the upper frontal region, well away from the midline, such danger is not encountered, nor is any important center disturbed by the operation. In all cases thus far examined, practically no pain has been experienced.

The discovery of Noguchi has once and for all effectually disposed of parasyphilis or metasyphilis, at least so far as the central nervous system is concerned. General paralysis is true syphilis of the brain. The finding of the organism in the living brain by Forster, besides finally establishing the proof of Noguchi's work, may, it is hoped, lead to important changes in the therapy of the disease, particularly in early cases in which the damage to the cortex is slight. The opinion has been expressed that the organism is not present in all cases of paresis. Considering, however, the small number of cases examined, with the relatively high percentage of positive findings (40 per cent.), together with the fact that in the brain puncture but a very minute portion of the cortex is examined, it would appear more rational to believe that the organism is present in all cases. A negative finding is obviously no indication of its absence.

It is not too much to hope that the demonstration of the spirochete in cases in which the cortical centers are as yet not greatly involved, and in the possible absence of other positive findings, may be followed by an arrest of the course of the disease under appropriate treatment.

It has hitherto been assumed by syphilographers that paretics could not transmit syphilis. The discovery, however, of the organism in the living brain of such subjects casts more than a shadow of doubt on this theory.

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[1] 1. Marie, Levaditi and Bauchowski: Bull. méd., Paris, 1913, No. 34.

[2] 2. Forster, E., and Tomasczewski, E.: Nachweis von lebenden Spirochäten im Gehirn von Paralytikern, Deutsch. med. Wchnschr., 1913, xxxix, No. 26.

Knee-Jerks in Hysteria.—It requires great boldness on the part of any individual to diagnose hysteria in a case in which the tendon-jerks are absent. The plantar reflexes may be absent in a case of functional disease, hysteria, but the knee-jerks are increased.—J. S. Risien Russell, in *Clin. Jour.*

THE ADMINISTRATION OF SALVARSAN AND NEOSALVARSAN BY ENTEROCLYSIS

REPORT OF THIRTY-SEVEN INJECTIONS *

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The method which we are about to describe is apparently unique, for in only three instances[1] have we found references in the literature to similar procedure.

The method which we use is simple, and the apparatus is not at all complex. The evening before treatment the patient is given a dose of saline cathartic to empty the bowels completely. He is then directed to take a rectal douche of soap solution about one hour before coming for treatment. If he is to be treated in the afternoon, we allow him to have a light breakfast and to take his enema one hour before the appointed time for treatment. If he is to be treated in the forenoon, he has no breakfast. We insist on three points: that the patient be hungry, thirsty and empty. He is then placed on the table and given a dose of morphin hypodermically, the dose varying from one quarter grain down, according to size and age. Children are given a dose of paregoric by mouth. This is given to relieve the patient of any possible irritation of the rectal tube, and also to aid in constipating his bowels. He is then placed on his right side, in the semiprone position, with the head of the table tilted down. We then pass the rectal tube or catheter, about a No. 20 French for adults, for a distance of about 12 inches or as far as possible. If the catheter is passed correctly it should be in the sigmoid flexure, as the rectum is supposed to be about 8 inches long in the average person. After the injection the bowels are constipated for from twenty-four to forty-eight hours. It may be of interest to note in passing that Dr. Chapin of New York has recently proved by means of the Roentgen ray, that suspensions of barium salts flow through the entire large intestine of children, to the ileocecal valve, when the suspension is just allowed to flow into the rectum through a short rectal tip or douche nozzle.

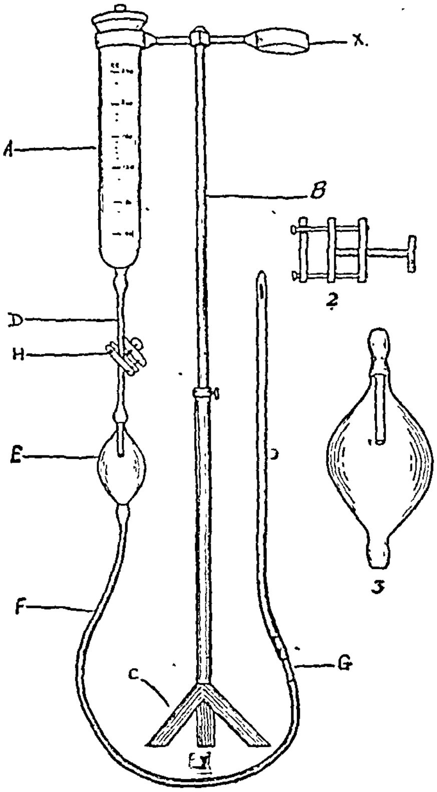
The solution is prepared exactly as in the intravenous method, except that we dilute to exactly 240 c.c. The reason for this will be stated further on. The solution is then poured into the apparatus.

APPARATUS

The apparatus is a cylindrical vessel (*A*) such as is found in the Boehm apparatus, graduated in 10 c.c., to 240 c.c., supported on an extension upright (*B*) and a solid base (*C*). Attached to this cylinder is a rubber tubing (*D*) about 6 inches long, at the other end of which is attached a special glass dropper-bulb (*E*), such as is used in the intravenous anesthesia apparatus, by means of which we can see the rate of flow. Attached to the distal end of the dropper-bulb is another piece of tubing (*F*) about 2 feet long to the distal end of which is attached a tapered glass connection (*G*). The rate of flow is easily regulated by a Hoffman cut-off (*H*), attached to the tubing (*D*), which allows a flow of any desired speed by the turning of a screw. This apparatus is so arranged that two patients can be treated at the same time, if a second cylinder, bulb, cut-off and tubing be attached to the apparatus at the ring (*X*). This improvised apparatus has given us complete satisfaction.

TECHNIC

The patient having been prepared as described is placed on the table and given his morphin or paregoric as the case may be. We then prepare the solution with warm water previously sterilized by boiling. The apparatus which was previously cleaned, either by allowing very hot sterile water to flow through it or by boiling, is filled with the solution. The rectal tube previously boiled is then inserted to about 12 inches, connected up to the tapered glass (*G*) of the apparatus, and the fluid allowed to drop. Now if the flow is regulated, so that it drops at the rate of 60 drops per minute, it will take just one hour for the 240 c.c. to pass into the patient. This is ample time for absorption and does not irritate the rectum, as we have proved a number of times. We have seen a very rapid injection retained and apparently absorbed with good effect, but we feel that we cannot recommend it. We also feel that the slow method which is practically a "Murphy drip" method is the better of the two.



Apparatus for the administration of salvarsan and neosalvarsan by enteroclysis.

We have given in this way thirty-seven injections to thirty patients. Of these injections five were with neosalvarsan and thirty-two were with salvarsan. We have seen no bad after-effects in general. One patient had a severe vomiting and weak spell, which necessitated a rest in the office for a few hours. This we believe was due to his having disobeyed our instructions, inasmuch as he had taken two glasses of beer and two hard-boiled eggs just before coming for treatment. Other than in this one case, we have seen no alarming ill effects. We have, however, seen a number of cases of moderate vomiting and urinary frequency following these injections. All of our patients were treated in our offices and returned home from there. The ages of our patients varied from 6 to 56 years. We have seen all the various manifestations of syphilis, such as chancres, genital and otherwise, rashes, condylomas, gummas and secondary and tertiary throat lesions, clear up with this method, and it is difficult to say whether or not the intravenous administration would have done so any more quickly.

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* Read before the Yorkville (N. Y.) Medical Society, June 9, 1913.

[1] Weill, A. J.; Morel and Moriquand, G.: Administration of Salvarsan by the Rectum in Children, Bull. Soc. de pédiat. de Paris, xiv, No. 7; abstr., The Journal A. M. A., Dec. 14, 1912, p. 2190. Kolmer, J. A., and Schamberg, J. F.: Experimental Studies on Administration of Salvarsan by Mouth to Animals and Man, Jour. Exper. Med., May, 1912. Bagrow, S. L.: Salvarsan Administered by the Rectum, Berl. klin. Wchnschr., Jan. 15, 1912, xlix, No. 3.

Though technically this method may be attacked on the ground that we cannot demonstrate the exact amount of salvarsan absorbed, we feel that judging from our clinical work it is nearly all absorbed if given according to the directions previously laid down. Further, we believe that we are in a position to compare the results of this and other methods, and, judging from our work and the reports of those who tried our technic, that salvarsan and neosalvarsan by enteroclysis have a place in the therapy of syphilis and should be used whenever the intravenous method is refused or for any other reason cannot be given.

Theoretically one might object to the dropper bulb, because each drop falls through air. This objection may be valid for the first few drops, but as the air in the bulb is not renewed during the administration, there is little oxygen to attack the salvarsan and neosalvarsan. Again, as we have seen no toxic symptoms in this series, we believe that this objection is not practical and may be dismissed from consideration.

CONCLUSIONS

We believe from the literature and our studies that:

1. The administration of salvarsan and neosalvarsan by enteroclysis has a place in therapeutics.
2. In general it ought not to replace the intravenous method, because it is possible that, in passing through the intestinal mucous membrane or the liver after absorption, some of the salvarsan may be changed chemically, and in that way its therapeutic effect may be less per unit of dosage.
3. It should be used in children in preference to other methods.
4. It should be the method of choice when the intravenous method is not feasible.
5. The subject is worthy of further study to determine the exact place of this method in the administration of salvarsan and neosalvarsan.

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REMOVAL OF A FOREIGN BODY INTRODUCED INTO THE UTERINE CERVICAL CANAL TO PREVENT CONCEPTION

Aimé Paul Heineck, M.D., Chicago

Foreign bodies are sometimes introduced into the uterine cavity for the purpose of terminating an undesired pregnancy. Most frequently, they are employed in the absence of any legitimate indication.

These foreign bodies are responsible for a certain number of punctured and perforating wounds of the body and of the cervix of the uterus, inflicted by way of the vaginal canal. Some foreign bodies also have been inserted into the cervical canal to be retained more or less permanently; some of these devices are introduced and retained in the uterine cervical cavity merely to prevent conception. That their value as such is debatable, is amply demonstrated by what follows:

I have lately removed from the uterine cavity of several patients referred to me by other physicians a device which had been introduced into the uterine cervical canal with the positive assurance that conception was impossible as long as the "Jentsch self-retaining uterine tube" remained in the womb. Much to their astonishment and chagrin, these patients became pregnant, and aborted at various periods of gestation. In each of these cases, the uterine hemorrhage attending the abortion was unusually profuse, and in each, I experienced some difficulty in removing the device. In all of the cases, the placental and other ovular débris had to be removed instrumentally.

Mrs. F., aged 25, came into my service at the Jefferson Park Hospital on account of profuse uterine hemorrhage of about three days' duration. Interrogation and examination of the patient established the diagnosis of incomplete abortion. The patient could not believe that she was pregnant as she had purchased the self-retaining uterine tube and had had it introduced into the cervical canal on the assurance that it afforded absolute protection against the occurrence of pregnancy. A careful vaginal examination failed to detect the instrument, and the patient was in doubt as to its expulsion.

Expectant measures brought no relief, and the hemorrhage continuing, the patient was surgically prepared, anesthetized, and the cervical canal dilated. The so-called "protecting device" had escaped into the uterine cavity, and I could not have removed it without lacerating the uterine tissues, if I had not, to facilitate its extraction, made a complete unilateral division of the entire vaginal portion of the cervix. The self-retaining uterine tube was then removed, the uterine cavity emptied of the débris of a four months' ovum and the divided cervix sutured. Recovery was uneventful.

From my experience in the removal of these tubes, I would make the following statements:

1. Once inserted, they are difficult to remove; in two of my patients, a unilateral division of the vaginal portion of the cervix was required to effect the extraction of the instrument.
2. They do not prevent conception.
3. They not uncommonly induce abortion or miscarriage.
4. They may cause infectious phenomena productive of invalidism.

1809 South Trumbull Avenue.

New and Nonofficial Remedies

The following additional articles have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association. Their acceptance has been based largely on evidence supplied by the manufacturer or his agent and in part on investigation made by or under the direction of the Council. Criticisms and corrections are asked for to aid in the revision of the matter before publication in the book "New and Nonofficial Remedies."

The Council desires physicians to understand that the acceptance of an article does not necessarily mean a recommendation, but that, so far as known, it complies with the rules adopted by the Council.

W. A. Puckner, Secretary.

ELECTR-HG.—Electromercurol.—Electr-Hg is a colloidal suspension of mercury equivalent to 0.1 per cent. metallic mercury (Hg) and containing a small percentage of sodium arabate.

Electr-Hg is prepared by passing an electric current in the form of an arc between two mercury electrodes in distilled water. It is made stable by the addition of sodium arabate, which is prepared by acting on acacia (gum arabic) with hydrochloric acid precipitating the resulting arabic acid with alcohol and neutralizing the arabic acid with sodium carbonate.

Electr-Hg is an odorless, tasteless liquid appearing transparent and brown in color by transmitted light and opaque and gray by reflected light. The addition of potassium cyanide solution or of strong nitric acid yields clear, colorless solutions. The nitric acid solution responds to tests for mercury.

Actions and Uses.—Electr-Hg is claimed to have an action similar to that of the soluble salts of mercury. Locally it is said to produce no pain when given by intramuscular injection, and to leave no induration.

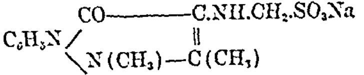
Dosage.—It is injected intramuscularly and intravenously in doses of 5 c.c. per day. For the intraspinal injection the dose is from 1 to 2 c.c., injected once a month or less frequently according to the effects it produces.

Electr-Hg is marketed in ampules only, in a non-isotonized condition. The package contains a physiologic salt solution with directions for the extemporaneous isotonization of the preparation before the injection.

Manufactured by Comar and Cie., Paris, France. No U. S. patent or trademark.

Ampoules Electr-Hg, 5 Cc.—Each ampule contains electr-Hg 5 Cc. (75 minims).

MELUBRIN.—Melubrin is sodium 1-phenyl-2,3-dimethyl-5-pyrazolon-4-amido-methan-sulphonate,



$$\begin{array}{l} \qquad\qquad \mathrm{CO}\text{————}\mathrm{C.NH.CH_2.SO_3Na} \\ \mathrm{C_6H_5N}\diagup \qquad\qquad\qquad \| \\ \qquad\qquad \diagdown\mathrm{N(CH_3)—C(CH_3)} \end{array}$$

the sodium salt of 1-phenyl-2,3-dimethyl-5-pyrazolon-4-amido-methan-sulphonic acid, differing from antipyrine, $C_{11}H_{12}N_2O$, in that a sodium-amido-methan-sulphonate group, $.NH.CH_2.SO_3Na$, has replaced a hydrogen atom of the pyrazolon group.

Melubrin is prepared by allowing a solution of formaldehyd bisulphite to act on 1-phenyl-2, 3-dimethyl-4-amido-pyrazolon, and purifying the resulting product by recrystallization.

It is a white, odorless, almost tasteless crystalline powder, readily soluble in water, but slightly soluble in alcohol. The aqueous solution is neutral in reaction but unstable.

If about 0.2 Gm. of melubrin dissolved in 5 Cc. of water be boiled with 3 Cc. of diluted hydrochloric acid, sulphur dioxid and formaldehyd will be liberated.

If ½ of the solution thus formed be treated with 3 drops of sodium nitrite solution and 5 Cc. of an alkaline solution of beta-naphthol, a red precipitate will be produced.

If the remainder of the above solution be treated with 1 Gm. of sodium acetate and 15 Cc of a saturated aqueous benzaldehyd solution, a yellowish white, flocculent precipitate will be formed which, when washed and dried, will melt at 173 degrees.

If a small quantity of melubrin be moistened with hydrochloric acid, it will respond to the flame test for sodium.

If a 10 per cent. aqueous solution of melubrin be made alkaline with ammonia, saturation with hydrogen sulphide should produce no change.

If 0.5 Gm. of melubrin be thoroughly mixed with 4 Gm. of sodium nitrate and gradually heated, 4 Cc. of concentrated sulphuric acid added to the resulting mass, and the mixture heated till no further white fumes are produced, the resulting substance powdered and mixed with 10 Cc. of saturated stannous chlorid solution, no darkening should occur within 1 hour.

If 0.4 to 0.5 Gm. of melubrin be weighed to a platinum dish, treated with dilute sulphuric acid, and heated to constant weight, the sodium sulphate thus formed should weigh 0.2160 to 0.2250 Gm. for each Gm. of material used, representing a sodium content of 6.99 to 7.28 per cent.

Actions and Uses.—It is claimed that melubrin in ordinary or even large doses is not toxic. In moderate doses it is said to have almost no effect on the circulation or respiration. It acts as a powerful antipyretic in fever and is analgesic.

Melubrin is said to be useful in painful affections, such as sciatica and other neuralgias, and as an antipyretic in various febrile affections. It is said to have effects similar to salicylates in acute rheumatism.

Dosage.—1 to 2 Gm. (15 to 30 grains). The larger doses are recommended for the treatment of rheumatism. It is claimed that as much as 10 Gm. (150 grains) may be given daily.

Manufactured by Farbwerke vorm. Meister Lucius and Bruening, Hoechst, a.M., Germany (Farbwerke-Hoechst Co., New York). U. S. Patent No. 1,056,881. (March 5, 1913; expires 1930). U. S. trademark applied for.

ACNE VACCINE.

Cutter Laboratory, Berkeley, Cal.

Acne Bacillus Vaccine.—Acne Bacillus Bacterin.—Each Cc. contains 50 million killed acne bacilli suspended in physiologic salt solution with 4/10 per cent. trikresol. Dose, from 5 to 50 million killed bacteria.

BACILLUS COLI VACCINE.

Cutter Laboratory, Berkeley, Cal.

Coli Vaccine.—A suspension of the Bacillus coli communis in physiologic salt solution with 4/10 per cent. trikresol. Containing 50 million killed Bacilli coli per Cc. Dosage from 10 to 100 million.

PNEUMOCOCCUS VACCINE.

Cutter Laboratory, Berkeley, Cal.

Pneumococcic Vaccine.—Pneumococcic Bacterin.—A suspension of mixed strains of the Diplococcus pneumoniae in physiologic salt solution with 4/10 per cent. trikresol. Containing 50 million killed pneumococci in each Cc. Dosage, from 10 to 100 million.

STAPHYLOCOCCUS VACCINE.

Cutter Laboratory, Berkeley, Cal.

Staph-Acne Vaccine.—Staph-Acne Bacterin.—A mixture of killed staphylococci and of killed acne bacilli in physiologic salt solution with 4/10 per cent. trikresol; each Cc. containing 500 million staphylococci and 50 million acne bacilli or in like proportions in greater or lesser counts. Dosage from 100 million to 2 billion.

Staphylococcic Vaccine.—A suspension of the Staphylococcus aureus, albus and citreus in physiologic salt solution with 4/10 per cent. trikresol. A suspension of various strains of staphylococci containing about 500 million to each Cc. Dose, from 100 million to 1 billion killed bacteria.

BACILLUS PYOCYANEUS VACCINE.

Cutter Laboratory, Berkeley, Cal.

Pyocyaneus Vaccine.—A suspension of mixed strains of killed bacillus pyocyaneus, in physiologic salt solution with 0.4 per cent. trikresol, 1 Cc. containing about 50 million killed bacilli.

ANTIGONOCOCCUS SERUM.

Lederle Antitoxin Laboratories, New York City. (Schieffelin and Co., New York.)

Antigonococcus Serum.—Marketed in a special syringe containing 10 Cc., with sterile needle.

ANTIMENINGOCOCCUS SERUM.

Lederle Antitoxin Laboratories, New York City. (Schieffelin and Co., New York.)

Antimeningococcus Serum (Antimeningitis Serum).—Marketed in an aseptic glass cylinder containing 15 Cc. with special sterile needle and stylet.

ANTISTREPTOCOCCUS SERUM.

Lederle Antitoxin Laboratories, New York City. (Schieffelin and Company, New York.)

Antistreptococcus Serum.—Marketed in an aseptic glass cylinder with sterile needle and rubber bulb connection; the cylinder contains 50 Cc.

Antistreptococcus Serum, Polyvalent.—Marketed in a special syringe containing 10 Cc.

ANTIPNEUMOCOCCUS SERUM.

Lederle Antitoxin Laboratories, New York City. (Schieffelin and Co., New York.)

Antipneumococcus Serum.—Marketed in an aseptic glass cylinder with sterile needle and rubber bulb connections; the cylinder contains 50 Cc. Also in a special syringe containing 10 Cc., with sterile needle.

NORMAL HORSE SERUM.

Lederle Antitoxin Laboratories, New York City. (Schieffelin and Co., New York.)

Normal Horse Serum.—Marketed in a special syringe containing 10 Cc., with sterile needle. Also in an aseptic glass vial, containing 100 Cc.

STREPTOCOCCUS VACCINE.

Cutter Laboratory, Berkeley, Cal.

Streptococcic Vaccine.—Streptococcic Bacterin.—A suspension containing in each Cc. 50 million of killed streptococci in physiologic salt solution with 4/10 per cent. trikresol. Dose, from 5 to 50 million.

Lederle Antitoxin Laboratories, New York City. (Schieffelin and Co., New York.)

Scarlet Fever Treatment.—This product is marketed in four syringes containing respectively, 50 million, 100 million, 200 million and 400 million killed bacteria. Also marketed in four packages of two vials, each containing 50 million, 100 million, 200 million and 400 million killed bacteria. Also marketed in 20 Cc. vials in four strengths, 1 Cc. containing respectively, 50 million, 100 million, 200 million and 400 million killed streptococci.

Scarlet Fever Prophylactic.—This product is marketed in a package of three syringes containing, respectively, 250 million, 500 million, and 1 billion killed streptococci from scarlet fever cases. The content of these syringes should be injected subcutaneously at intervals of seven days. Also marketed in a package of three vials, each containing respectively, 250 million, 500 million and 1 billion killed bacteria.

TYPHOID VACCINE.

Cutter Laboratory, Berkeley, Cal.

Typhoid Vaccine.—A suspension of killed bacilli in physiologic salt solution with 4/10 per cent. trikresol, containing 50 million killed typhoid bacilli of various strains in each Cc. Dosage from 5 to 50 million every 3 to 5 days.

Typhoid Prophylactic.—A suspension made from a single strain, viz., that employed by the United States Army. Each Cc. contains 1 billion killed typhoid bacilli. Put up in packages containing 3 bottles. Bottle No. 1 contains 500 million; bottle No. 2, 1 billion; bottle No. 3, 1 billion killed typhoid bacilli.

National Vaccine and Antitoxin Institute, Washington, D. C.

Anti-Typhoid Vaccine (Immunizing).—This vaccine is prepared according to the technic of Russel from the strain used in the U. S. Army. It is marketed in three syringes containing respectively 500, 1,000, and 1 billion killed typhoid bacilli; also in ampouls containing the same doses.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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Cable Address . . . . "Medic, Chicago"

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SATURDAY, SEPTEMBER 13, 1913

DIFFERENTIAL IMPORTANCE OF THE ALCOHOL CONTENT OF THE BLOOD

We have not increased our information concerning the mechanism by which the body defends itself and decreases its susceptibility to simple chemical poisons to anything like the extent to which we have advanced our knowledge about immunity to bacteria and to foreign proteins. That the processes involved in acquiring resistance to the two classes of poisons are quite different seems to be established, and for the most part the simple poisons seem to be attacked by simple chemical processes, such as oxidation, precipitation or union with simple chemical radicals. There is no more marked illustration of acquired tolerance to a chemical poison than that furnished by alcohol, and in view of its significance for the general problems of immunity or adaptation, a recent study of the alcohol content of the blood during different conditions is of considerable importance.[1]

The author of this article, Schweisheimer, first took up the old problem of the normal occurrence of alcohol in the blood and tissues, concerning which there is disagreement. He found that human blood from subjects who have not had any alcohol does contain minute quantities of volatile, oxidizable substance, corresponding to about 0.003 per cent., a finding supporting results previously obtained with animal blood and tissues. Unfortunately, there seems to be no available method which will determine positively whether these minute quantities of volatile material really are alcohol or not, for there are other organic substances which might be present and, in the quantities in which they exist, indistinguishable. Schweisheimer believes that the material in question is, at least in large part, alcohol.

The alcohol content of the blood of persons in various stages of intoxication, on the other hand, is quite considerable, and in a general way corresponds to the degree of intoxication; but there is a striking difference in the curve of the alcohol content in the blood of habitual drunkards and of abstainers. In persons unaccustomed to alcohol the maximum proportion of alcohol in the blood is reached in from about one and one-half to two hours after drinking a considerable quantity of wine (about 1 liter of a wine containing 10.35 per cent. of alcohol), and remains at nearly the same concentration for about five or six hours, then gradually falls, and by the twelfth hour is nearly all gone. The habitual drunkard, however, shows a quicker rise in the alcohol content of the blood to a maximum, which is maintained for but a comparatively short time, about two hours, and then the curve rapidly falls to near zero. Furthermore, in the alcoholic subject the maximum content is much lower than with the abstainer given the same amount of alcohol. When the blood contains over 0.02 per cent. alcohol the subject may show symptoms of intoxication, and usually does when it reaches 0.05 per cent. With the dosage mentioned, the content of alcohol in the blood reached from 0.1 to 0.15 per cent. in some cases, while in drunken men brought into the hospital amounts from 0.12 to 0.23 per cent.[2] were found.

The analytic results agree well with the recognized features of the influence of alcohol on the accustomed and the unaccustomed, and indicate that the former in some way get rid of their alcohol more rapidly than abstainers. Presumably this is by a more active oxidation, but in what tissue or through what agency is as yet undetermined. The results obtained with nondrinkers, moderate drinkers and confirmed drunkards show a progressive ability to keep down the quantity and persistence of alcohol in the blood, indicating that this faculty is of gradual acquirement. As with equal concentrations of alcohol in the blood of drunkards and non-drinkers, however, the latter show much greater evidence of intoxication, it would seem that there are other factors to be considered. Probably the grave danger of acute alcoholism in the unaccustomed drinker lies especially in the long period during which the maximum alcohol content persists in the blood.

It would seem that the accurate determination of the alcohol content of the blood is not difficult or time-consuming when once the apparatus is set up and the necessary experience gained. This being so, there is a diagnostic measure offered which should be of much value in those puzzling cases of coma in which alcoholism is suspected. In every large city mistakes are repeatedly being made in these cases, often with serious results when a diagnosis of alcoholism and a jail floor are provided for a man who has a skull fracture, uremic coma or some other dangerous and perhaps curable condition. If a routine analysis of the blood for alcohol content were made before a diagnosis of alcoholic coma would be accepted, such mistakes could be largely eliminated. A single drink will give grounds for a diagnosis of alcoholism if the diagnostician relies on his olfactory sense alone, but it will not so raise the alcohol content of the blood as to warrant such a diagnosis.

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[1] Schweisheimer, W.: Der Alkoholgehalt des Blutes unter verschiedenen Bedingungen. Deutsch. Arch. f. klin. Med., 1913, cix, 271; abstr., The Journal A. M. A., March 1, 1913, p. 704.

[2] In our abstract of this article through an error the figures were given ten times too high. The proportion should have been given "per thousand," instead of "per cent."

DIABETIC CONDITIONS DUE TO STARVATION

It has been known for some time that during a period of inanition the tolerance of animals for carbohydrate may be greatly diminished. Whether this is likewise true in the case of man cannot be stated with certainty so far as chronic starvation is concerned, for the observations on record are insufficient to permit of any convincing conclusion in the matter. When these phenomena of "starvation diabetes" were first noted it was suggested that the explanation lay in an inability of the organism to utilize sugar as efficiently during a period of inanition as during ordinary conditions of well-being. Obviously such a statement is at best hypothesis of the vaguest sort and fails to afford any concrete idea of the nature of the deficiency involved.

Not long ago, under the heading of "Acid Diabetes,"[1] we discussed the alleged influence of acids on the metabolism of carbohydrates. We spoke of the suggestion from von Noorden's clinic that even comparatively small quantities of acid introduced into the organism can "mobilize" glycogen in the body, giving rise in this way to hyperglycemia and a consequent glycosuria. The experimenters further believed that this sequence of events is quite independent of the adrenals, which have of late been called on to explain the genesis of diverse conditions leading up to elimination of sugar by the kidneys. In the case under discussion the liver was designated as the presumable point of the sugar-liberating attack by the acids.

From such an experimental starting point it was a logical sequence to inquire whether various pathologic conditions attended with a development of acid in the disturbed metabolic processes themselves, rather than the contribution of acid from outside the body, might not sometimes be responsible for glycosuric or diabetic phenomena like those described. We use the term "diabetic" here in the sense of lowered tolerance for, or utilization of, carbohydrates. And since in starvation such conditions may arise, it has been asked whether a pathologic development of acid might not be responsible. In the first medical university clinic in Vienna, Elias and Kolb,[2] following the lines of their earlier studies on acid and diabetes, have demonstrated that, in dogs at least, the "starvation diabetes" is actually accompanied by a greater acidity of the blood and by an unmistakable hyperglycemia, independent of adrenal perturbations. These consequences are apparently not attributable to defects of absorption or unusual permeability of the kidneys. They involve some process of intermediary metabolism and can be more or less effectively repressed by administration of alkali, the natural antagonist of acids.

A few years ago it would have seemed far-fetched to look upon starvation as anything fundamentally pathologic. The consequence of lack of food was assumed to be a purely negative one, in which certain physiologic processes ceased or slowed down. To-day, prolonged inanition, whether voluntarily induced or the enforced result of disease, is no longer to be regarded as a purely indifferent situation. Metabolism in starvation is admittedly abnormal.

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[1] Acid Diabetes, Editorial, THE JOURNAL A. M. A., July 5, 1913, p. 44.

[2] Elias, H., and Kolb, L.: Ueber die Rolle der Säure im Kohlenhydratstoffwechsel, II. Ueber Hungerdiabetes, Biochem. Ztschr., 1913, lii, 331.

ERADICATING ROCKY MOUNTAIN SPOTTED FEVER

The work of clearing the mountains and valleys of the spotted fever district in Montana, inaugurated some years ago, is still being carried on vigorously. Since the death of Dr. McClintic, who contracted the fever while working in Montana, Dr. L. D. Fricks of the United States Public Health Service has carried on the work in the Bitter Root Valley. In a recent report in which he discusses the method heretofore employed in destroying the ticks, such as cleaning and cultivating the land, burning over foot-hills and slashes, killing small wild mammals, dipping domestic animals in solutions of arsenic, and removing ticks by hand from domestic animals, all of which are cumbersome and expensive to apply and only in a measure effective, Fricks[1] gives the results of some experiments with sheep as a means of eradicating the tick. The methods previously employed have been used for three years without greatly diminishing the number of ticks or the number of deaths from spotted fever.

The infection in its most virulent form exists in certain districts on the west side of the Bitter Root River, a region still in the primitive state. On the east side of the river, where the territory has been cultivated and where most of the efforts to eradicate the tick have been employed, there are comparatively no ticks; but in small portions of the territory on the west side the ticks exist literally in millions and their eradication by the methods named seems almost hopeless. It is found, however, that the ticks do not flourish for any considerable length of time in the region pastured by sheep. Experiments by Fricks and his assistants during the present year show some rather interesting results. As summarized in the report, 87 per cent. of 295 ticks placed in the wool of unshorn sheep were found dead. The majority of the ticks recovered from sheep grazing naturally over the tick-infested territory were dead. It is known that the fertilization of the female ticks takes place while on the larger domestic animals. Sheep seem to be particularly unsuitable for tick propagation and many of the females recovered from the sheep appeared not to have been fertilized. Comparatively few ticks, either dead or alive, were found on the sheep after they had been shorn. In this investigation only sixty-one sheep were employed. Fricks proposes to test the method still further in the coming season by placing a flock of two thousand sheep on some tick-infested range on the west side of the Bitter Root River organs functioning in the production of energizing internal secretions. Over these organs—the thyroid, the adrenals, the hypophysis—the "contact ceptors" have no control, if we may trust laboratory evidence. Apparently no amount of physical trauma inflicted on animals will cause hyperthyroidism or increased epinephrin in the blood, while fear and rage are said to occasion them. As Crile says, this is a statement of far-reaching importance and is the key to an explanation of many chronic diseases such as are associated with the intense stimulation of the special senses in human relations. We are reminded that chronic emotional stimulation may fatigue or exhaust the brain, and may cause cardiovascular disease, indigestion, hyperthyroidism, diabetes and insanity even.

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[1] Fricks, L. D.: Pub. Health Rep., Aug. 8, 1913.

These purely mechanistic conceptions of some of the phenomena of the nervous system frequently run counter to the inherited traditions regarding the make-up and behavior of the human organism; but they are here to be dealt with and, what is more important, they are fruitful in practical suggestions derived therefrom.

Current Comment

THE "FRIEDMANN INSTITUTES"

Once more it should be stated that the so-called Friedmann cure for tuberculosis is utterly discredited. All reliable reports regarding the treatment of patients by Friedmann's method seem to show either that it is actually injurious or else that it is less efficient than other well-known and less dangerous means of treatment. While attention has already been called to the facts, it is worth while again to remind our readers that: 1. Dr. Mannheimer reported on the results of eighteen cases in New York in which the Friedmann "treatment" was used, and stated that in not a single one of the eighteen cases was there definite improvement to date that could be attributed to the "treatment." 2. A committee of some of the foremost physicians of Canada was appointed to watch the patients inoculated by Dr. Friedmann in the Canadian hospitals. These physicians made a similarly unfavorable report. 3. Dr. Anderson, acting under the authority of the United States government, watched the progress of the patients treated by Dr. Friedmann in this country. He also gave an unfavorable opinion as to the effect of the treatment. 4. The Friedmann "treatment" has been condemned by German physicians generally. 5. A report from the Rhode Island State Sanatorium on the results in 120 patients treated by the Friedmann method states that the patients "have shown none of the immediate and wonderful results reported by Friedmann," but that, "on the contrary, about 17 per cent. of the cases" are worse than they might have been expected to be under ordinary sanatorium treatment. This, and more is true, and yet the company which is exploiting this so-called cure is, apparently, able to find physicians who are willing to aid in this inhuman business. After all, this might be expected; it has always been possible to find men willing to do disreputable work, if sufficient financial inducements are offered. While we believe that the medical profession harbors but a small proportion of men of this type, it has some within its ranks who are willing to sell their birthright of professional decency for a mess of pottage. As has been previously said, the scheme of floating Friedmann institutes in different states successfully evades any reprisal on the part of the federal government. It therefore devolves on the various states to take such action as is necessary to prevent the heartless exploitation of the unfortunate consumptives within their borders.

THE CIRCULATION AND MUSCULAR EFFICIENCY

It is a familiar observation that the circulation is affected by muscular effort. One of the features commonly observed during muscular exercise is an augmented blood-pressure. No one seems to have paid any attention to the reverse situation, namely, the possible influence of altered circulatory conditions such as changes in arterial pressure on the efficiency of the muscular apparatus. Dr. Gruber[1] of the Harvard Medical School has investigated this aspect of the relation of the circulation to muscular ability, and particularly what effect changes of arterial pressure, either increase or decrease, may exert on neuromuscular fatigue. He has found that there are unmistakable evidences of alterations in muscular vigor demonstrable in an experimental way. When the circulation is improved by increasing the arterial blood-pressure the intensity of the contractions of skeletal muscles may be decidedly increased. This is true, however, only when the pressure is comparatively low to begin with, that is, below from 90 to 100 mm. of mercury. When the initial pressure is above this level little improvement ensues from a further enforced rise. Correspondingly, as the blood-pressure or the circulation is decreased, the vigor of the muscular contractions is lowered—here again this deterioration takes place only when the arterial pressure falls below the limits quoted before. Evidently there is a critical region of arterial pressure which conditions the most satisfactory working power. This is easily understood when we remember that fatigue products accumulate in a muscle when it is doing work. As the pressure rises, thus bettering the blood-flow through the active muscle, these products are carried away more rapidly, and more oxygen is brought to places where it is most needed.

THE PASSING OF THE BASEMENT HOME

This month the basement as a living-room will, officially, pass out of existence in Missouri. The movement is significant as the beginning of a realization by the legislative bodies of the country that the conservation of public health is the most important factor in political economy. The basement living-room, coupled with the daily toil of children in factories and sweatshops, has enormously increased the death-rate among the children of the lowly. Particularly related to a dark, damp basement home is a lowered condition of vitality, which predisposes to infection by tuberculosis and aids the vicious spreading of all the acute exanthems. If, in Missouri, where conditions of population are at most not crowded, such a step has seemed necessary, how much more must such a law be needed in the densely packed tenements of New York, Chicago and other metropolitan cities? Missouri, in the past, has insisted that she must "be shown"; here, indeed, she has pointed the way for her sister states.

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[1] Gruber, C. M.: Studies in Fatigue, Am. Jour. Physiol., 1913, xxxii, 221

THE HETEROGENEOUS LIPOIDS

The term "lipoids" is used as a generic name for those constituents of living cells which can be extracted by ether or similar solvents. It is a biologic rather than a chemical term, and includes substances of quite different chemical composition such as cholesterol, which is an alcohol, and lecithin, which is a complex fat. The impropriety of putting these two substances in the same class biologically is shown by recent research which demonstrates that they possess physiologic actions which are diametrically opposed to each other. The companionship of lecithin and cholesterol in the so-called lipoids of animal cells and tissues is appreciated by biologic chemists; but the differentiation of the respective rôles of these compounds in physiologic phenomena is still largely a task of the future. Observations derived from the field of the study of immunity reactions have furnished instances which lead one to believe that in many cases these two classes of compounds, so unlike in chemical structure despite their superficial resemblances in point of solubility and physical behavior, are antagonistic in biologic deportment. Thus in the phenomena of hemolysis, cholesterol and lecithins (phosphatids) undoubtedly manifest quite unlike reactions in relation to the red blood-corpuscles. A comparable illustration of similar differences has been furnished by a recent study of phagocytosis.[1] Cholesterol, even in small proportions, vigorously inhibits the phagocytic response of healthy leukocytes; but the inhibition can be completely overcome by means of lecithin. This furnishes only an added instance that warns us against drawing any sweeping conclusions as to the functions of heterogeneous mixtures of ether-soluble tissue components—responses that are referred to as "lipoid reactions" or "lipoid phenomena." Biochemical research has at length reached a point at which it becomes necessary to distinguish, as clearly as our present information will permit, between the physiologic behavior of the individual representatives of an interesting and potent group of tissue components.

THE BEHAVIOR OF DIFFERENT FATS IN THE STOMACH

The fact that ingested fats distinctly retard both the secretory functions and the motility of the stomach is applied in a practical way in clinical medicine, particularly in gastric hyperacidity and hypersecretion. This raises the question as to whether or not there are any differences in the physiologic behavior of fats in the stomach depending on the quality, physical properties and texture of the material fed. The edible fats of commerce vary widely in these respects, ranging from the liquid olive-oil, on the one hand, to the more consistent mutton fat, on the other. A recent study of the subject[1] has made it clear that they are discharged from the stomach into the intestine at varying rates depending on their melting-points—an index of texture—and their viscosity. It matters little whether the fats are emulsified or not; they leave the stomach relatively more slowly if their melting-point is higher and their viscosity greater. Among familiar examples, therefore, olive-oil, beef fat and mutton fat are transported out of the stomach at a speed in the order mentioned, the harder mutton tallow being delayed longest under comparable circumstances of feeding. Fats administered in the form of emulsions along with other food are discharged from the stomach more promptly than emulsified fats administered in a comparable way. The delay in the release of fat is, in general, greater in the absence of other foods than when there is some dietary admixture. From the experiments which have been made it appears that fats are promptly released from any intimate mixture with other nutrients in the company of which they may have been fed; so that they tend to enter the intestine by themselves. The degree of inhibition which they exert on the progress of their companion food materials through the pylorus depends in turn on their physical properties: the more viscid fats retard the discharge of other (non-fat) foods less than the more liquid types. It follows, therefore, that the dietotherapeutist cannot only employ fats to suit his needs in relation to the performances of the stomach, but by exercising discrimination in respect to texture and state of emulsification he can also further modify or regulate the results which he is aiming to accomplish.

THE CEREBROSPINAL FLUID IN CHEMICAL DIAGNOSIS

A chemical diagnosis of nervous and mental diseases can scarcely be said to exist at present. Doubtless there are changes in the composition and metabolism of the nervous tissues, particularly the brain, which attend marked pathologic alterations in the structures. But inasmuch as the entire nervous system comprises only about 2 per cent. of the total body in point of bulk, one can well understand why even very considerable contributions from an organ like the brain should make only an insignificant distinctive impression on the composition of the blood or urine or feces that represents the sum total of the physiologic transformations of all the other organs and tissues as well. The most promising outlook for the discovery of chemical diagnostic signs of alterations in nervous tissues lies in the direction of the cerebrospinal fluid which, bathing the tissues, is, as it were, the immediate representative of the waste and wear of the cells and ought to contain the products of their metabolism in most concentrated and least altered form. We need scarcely add that from the point of view of bacteriologic diagnosis the clinical examination of the cerebrospinal fluid has already proved to be of great assistance in practice. Chemical studies of the cerebrospinal fluid have not been wanting in the past, and some of the alleged clinical tests that are in use are in reality chemical reactions. Broadly speaking, little progress has yet been made in this field, probably because the investigations have never been conducted on a sufficiently comprehensive scale to bring out characteristic alterations unquestionably attributable to definite diseased states. Dr. R. V. Stanford,[1] research chemist of the Cardiff City Mental Hospital in Great Britain, has reported a series of determinations of the specific gravity of the cerebrospinal liquor which suggests the existence of detectable differences associated with degenerative changes in the central nervous system. The probability that, in contrast with purely functional psychoses, progressive paralysis and severe dementia are accompanied by a loss of tissue substance is attested by the anatomic findings and also made likely by Stanford's observations. Thus he has noted the specific gravity of the cerebrospinal fluid to be greater in progressive paralysis (from 1.0045 to 1.0047) than in other nervous diseases (from 1.0043 to 1.0045), with the exception of epilepsy. The concentration in progressive paralysis appears to increase with the progress of the disease, as one might expect on the hypothesis of progressive disintegration. Lower figures were obtained only in cases of remission.

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[1] Stuber, B.: Blutlipoide und Phagocytose, Biochem. Ztschr., 1913, li, 211

[1] Tangl, F., and Erdélyi, A.: Biochem. Ztschr., 1911, xxxiv, 94. Von Fejér, A.: Einfluss des Schmelzpunktes nicht emulgierter Fette auf die Geschwindigkeit ihrer Entleerung aus dem Magen, ibid., 1913, liii, 168.

Medical News

ARKANSAS

Fire Destroys Sanatorium.—The fire which swept Hot Springs, September 5, causing a destruction of more than $3,000,000 worth of property, burned the Ozark Sanatorium with a loss of $45,000, partially covered by insurance.

New Officers of State Board.—At the annual meeting of the State Medical Board of the Arkansas Medical Society, held in Little Rock, August 13, Dr. J. C. Wallis, Arkadelphia, was elected president; Dr. W. S. Stewart, Pine Bluff, secretary, and Dr. M. Fink, Helena, treasurer.

Plans Bureau of Vital Statistics.—The State Board of Health is planning to establish a Bureau of Vital Statistics as provided for by an act of the legislature. The Federal Government has detailed F. L. Watkins, special agent of the Census Bureau, to have charge of the work and to assist the state board.

Free Anti-Rabic Treatment.—The Arkansas State Board of Health announces that it is prepared to give free anti-rabic treatment to all persons bitten by dogs or other animals suspected of being rabid. To secure this treatment, it is necessary for the applicant to obtain an order on the board from the county judge for the treatment.

Personal.—Dr. E. F. Winegar, Hot Springs, accused of dividing fees for medical services, was acquitted by the jury, August 22. Dr. Winegar has reopened his sanatorium which was burned March 7.——Dr. J. E. Phillips, local surgeon for the Iron Mountain System at Fort Smith, who was operated on recently in St. Louis, has returned home, convalescent.

State Health Car for Arkansas.—At a recent meeting of the Arkansas County Medical Society, held at Stuttgart, Dr. T. B. Bradford, Cotton Plant, announced that he was working on a proposition to provide a health car to travel around the state, disseminating information regarding the prevention of disease, distributing literature and carrying with it a corps of lecturers for the education of the people.

CALIFORNIA

Seeks Site for Hospital.—Dr. John A. Reily of the State Hospital, Patton, is searching for a site for another hospital for Southern California. The institution is to cost about $90,000 and will occupy a site of about three hundred acres.

Hospital Notes.—The Universal City Hospital was formally dedicated August 8. Dr. Rollin French is in charge of the institution.——The City Council of Los Angeles has approved the plan of Drs. J. A. Jackson and F. L. Hough to establish a branch of the Emergency Hospital in Hollywood.——The Haben Hospital, Monrovia, recently erected by the Misses Haben, at a cost of $15,000, was opened August 8. The building is 50x90 feet and of bungalow design.——The new Pomona Valley Hospital, erected at a cost of $60,000, at Pomona, was formally opened the last week in August. The building is of concrete construction and practically fireproof and can accommodate twenty-five private patients.

COLORADO

Baby Clinic Abandoned.—Lack of patronage has caused Deputy Health Commissioner Hays and Dr. W. H. Sharpley, superintendent of the County Hospital, Denver, to abandon the plan to establish a baby clinic at that institution.

Personal.—Dr. Walter Morritt, superintendent of the Minnequa Hospital and head of the sociologic department of the Colorado Fuel and Iron Company, has resigned to accept the position as superintendent of the Beth-El Hospital, Colorado Springs.

FLORIDA

State Board Will Control Hydrophobia.—The State Board of Health of Florida has made arrangements to furnish the Pasteur treatment free to physicians of the state and also to make examinations of animals suspected of rabies.

Hospital Notes.—A site has been purchased in Pensacola on which it is understood that the Roman Catholics will erect a large hospital building.——The new St. Luke's Hospital, Jacksonville, is almost ready to receive patients and expects to open formally October 1.

Personal.—Dr. Hiram Byrd, Jacksonville, announces that he has severed his connection with the State Board of Health to be associated with the Grand View Sanatorium for Tuberculosis, Port Orange, Fla.——Dr. George W. Holmes, Sharpes, has returned after a trip to the Canal Zone and West Indies.

GEORGIA

New Officers.—Eighth District Medical Association at Elberton, August 20: president, Dr. W. J. Mathews, Elberton; secretary, Dr. Edward M. Coleman, Athens (reelected).

New Hospital.—The new hospital which the ladies of the Americus Hospital Association are to erect in that city, is to be located on the South Side of the city, and will be constructed of brick with granite trimmings, will contain thirty rooms, and will, it is expected, be ready to open before the end of the year.

ILLINOIS

Personal.—Drs. George N. Kreider and L. C. Taylor, Springfield, have returned from Europe.——Dr. and Mrs. W. Grant Hatch, Rockford, left for Europe, September 3.——Dr. J. Leslie, Elwin, celebrated his seventy-fifth birthday anniversary September 1.

Hospital for Fraternal Order.—The following staff of physicians has been appointed for Mooseheart, the industrial home of the Loyal Order of Moose: Drs. H. A. Brenneke and George A. Darmer. A building for the hospital is now under construction and work on the permanent building will be started this fall.

More State Hospitals Needed.—The State Charities Commission, in its annual report, urges the establishment in large centers of population of psychopathic hospitals for the care and treatment of the acute varieties of insanity, at which the commitment will be purely voluntary. It favors making the present state hospital into colonies for strictly chronic cases. It recommends that the first psychopathic hospital shall be established in Cook County. The commission urges that the study of psychiatry be made compulsory in all medical schools so that every person who enters the practice of medicine may have at least elementary knowledge regarding nervous and mental affections. A children's bureau, having broad power to deal with the dependent and delinquent classes, is also recommended by the commission.

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[1] Stanford, R. V.: Vergleichende Studien über Cerebrospinalflüssigkeit bei Geisteskrankheiten, I. Dichte, Ztschr. f. physiol. Chem., 1913, lxxxvi, 43.

Chicago

New Hospital.—The Washington Boulevard Association is erecting a five-story building at Washington Boulevard and North Campbell Avenue to cost about $100,000. The building is to cover a ground area of 126x70 feet. Dr. Albert I. Bouffleur is chief surgeon of the association.

Personal.—Dr. Isaac C. Frisch, a member of the staff of the Chicago State Hospital, Dunning, has been transferred by the state to the Chester State Hospital, Menard, succeeding Dr. William H. Hercik.——Dr. and Mrs. T. J. O'Malley and Dr. Cornelius A. Leenheer have returned from abroad.

INDIANA

New Officers.—Thirteenth District Medical Society at Lake Wawasee, August 29: president, Dr. T. J. Shackelford; secretary-treasurer, Dr. C. Norman Howard (reelected), both of Warsaw.

Census of Centenarians.—Under the direction of the State Board of Health, a census and study of the centenarians of Indiana is to be made. Dr. J. N. Hurty, secretary of the State Board of Health, believes that such a study and investigation may be productive of value to the medical profession. Dr. Frank B. Wynn is associated with Dr. Hurty in the work and is preparing blank forms for use in making investigations and reports.

Tuberculosis Notes.—Dr. A. H. Caffee, Terre Haute, announces that the Twin Hills Tuberculosis Camp will close early in October on account of lack of funds. Next year it is hoped to keep the camp open through at least a part of the winter.——The Gibson County Society for the Study and Prevention of Tuberculosis has built a model tuberculosis-prevention sleeping house in the court house yard at Princeton.——A county sanatorium for tuberculosis is to be established at St. Joseph County at a point north of South Bend, and condemnation proceedings have been filed to obtain the thirty acres of land necessary for the project. The buildings will cost from $30,000 to $50,000, and will be grouped around a central administration building.

Personal.—Dr. George A. Sigler, Indianapolis, while crossing a street, was struck by an automobile, fracturing two ribs and one arm. He is said to be doing well at present.——Dr. Claude C. Crum, Jeffersonville, dislocated his right arm while cranking his automobile, August 30.——Drs. E. J. Lent, R. C. Shanklin, R. B. Dugdale, W. H. Baker and H. F. Mitchell, South Bend, and Dr. C. A. Dresch, Mishawaka, have started for Europe.——Dr. R. S. Rissler, Indianapolis, who has been in the government employ in Manila for more than four years, has returned to this country on leave of absence and will take a special course in sanitation at Harvard Medical School and in Vienna, before returning to his post of duty.——Dr. J. R. Mountain, Connersville, has returned from Europe.

Long State Hospital Almost Ready.—The Robert W. Long State Hospital, Indianapolis, connected with the Indiana University School of Medicine, is nearly completed and expects to be ready to receive patients about November 1. This building has been erected with funds amounting to $225,000, given by Dr. and Mrs. Robert W. Long, Indianapolis. The new hospital will be under the supervision of trustees of the university and directly under the care of the University School of Medicine. Dr. Edward L. Lingeman is to be medical resident in charge of the institution.——The additional units of the Indianapolis City Hospital are being rapidly completed and by the time they are ready to receive patients, on October 1, the hospitals will have a total capacity of about two-hundred and fifty.

IOWA

Personal.—Dr. Charles B. Burk, Atlantic, is reported to be seriously ill in Mercy Hospital, Council Bluffs.——Dr. Mark F. Boyd, health officer and city bacteriologist of Oskaloosa, has resigned to accept a fellowship in the department of preventive medicine and hygiene in Harvard University.——Dr. Merle F. Warner, Council Bluffs, is under treatment in the Jennie Edmundson Memorial Hospital for paralysis.

About Tuberculosis Camps.—The action of the Des Moines Associated Charities in abandoning Ridge Camp, an outdoor tuberculosis sanatorium in Highland Park, will result in the County Board of Supervisors erecting a building on the County Farm at a cost of $3,000 for the use of tuberculosis patients. The Ridge Camp was abandoned on account of the few patients remaining to be cared for, and for the time being, a temporary tent colony has been established at the County Farm.

Judges in Baby Contest.—The list of judges in the Baby Health Contest at the State Fair, Des Moines, include Dr. Lenna L. Meanes, Des Moines; Dr. Agnes Eichelberger, Sioux City; Dr. Velura E. Powell, Red Oak; Dr. Margaret V. Clark, Waterloo; Dr. Lucy M. B. Harbach, Des Moines; Dr. Jennie G. Ghrist, Ames; and Dr. Sophie H. Scott, Des Moines. Mrs. Mary Watt of Audubon, general superintendent of the contests, will be assisted by Dr. Florence B. Sherbon, Colfax, and Mrs. A. O. Ruste, Charles City.

KENTUCKY

New Officers.—Letcher County Medical Society reorganized at Whitesburg, August 29: president, Dr. Thomas A. Cook, Democrat; secretary-treasurer, Dr. Demsey F. Smith, Whitesburg.

Obstetrical Clinic Opened.—A free obstetrical clinic has been opened in the building of the Associated Charities, Louisville, every Wednesday afternoon, beginning September 3. The Babies' Milk Fund Association, the Visiting Nurses of the Kings' Daughters, the City Health Department, the University of Louisville and the Associated Charities, have united to operate the clinic of which Dr. Gavin Fulton is medical director.

State Association Meeting.—At the annual meeting of the Kentucky State Medical Association held in Bowling Green, September 2-4, the following officers were elected: president, elect Dr. James W. Ellis, Masonville; president, Dr. W. O. Roberts, Louisville; vice-presidents, Drs. James L. Neel, Drake; Marshall McDowell, Cynthiana, and James B. Kinnaird, Lancaster; secretary, Dr. Arthur T. McCormack, Bowling Green, reelected; treasurer, Dr. William B. McClure, Lexington (reelected); councilors, Dr. Dunning S. Wilson, Louisville, fifth district, and Dr. Joseph E. Wells, Cynthiana, eighth district; delegates to the American Medical Association, Drs. William W. Richmond, Clinton, and Archibald H. Barkley, Lexington; orator in medicine, Dr. William A. Poole, Henderson; and orator in surgery, Dr. A. D. Willmoth, Louisville. Newport was designated as the meeting place for 1914.

LOUISIANA

Free Treatment for Children.—The city health officer of Shreveport on August 23, issued a statement announcing that "all eye, ear, nose and throat specialists and dentists have agreed to treat all children free whose parents are unable to pay, and I am sure the general practitioners will do the same."

Personal.—Dr. W. W. Butterworth, New Orleans, has returned from Europe.——Dr. J. N. Thomas, superintendent of the Pineville State Hospital, who recently underwent operation at Touro Infirmary, New Orleans, is recuperating at Cooper's Wells, Miss.——Dr. J. A. White has been elected president of the reorganized Board of Health of Alexandria.——Dr. and Mrs. Rudolph Matas, New Orleans, are spending the summer abroad.——Dr. and Mrs. George F. Cocker have sailed for Europe.

MARYLAND

Sanatorium Completed.—The Allegany County Tuberculosis Sanatorium of Haystack Mountain near Cumberland, has been completed, and was thrown open to the public, September 4.

Personal.—Dr. C. L. Andrews, of Johns Hopkins University, has accepted the position of professor of anatomy in the University of Mississippi Medical College.——Dr. W. W. Wiley, Cumberland, is reported to be seriously ill at his home.

MICHIGAN

Campaign for Endowment Fund.—The trustees of the Detroit College of Medicine and Surgery, at the forty-fifth annual meeting, reported that more than $100,000 had already been secured in the campaign for the $1,000,000 for an endowment fund.

MINNESOTA

Charities Board Budget.—The Charities Board budget for Minneapolis for 1914 amounts to $357,140. Of this $205,000 is for the addition of 350 beds to the City Hospital; $50,000 for the Hopewell Hospital for Tuberculosis, and $34,318 for the acquisition of Lymanhurst, a home for children.

County Hospitals for Tuberculosis.—County hospitals for tuberculosis have already been completed in St. Louis and Ottertail counties.——The hospital for Ramsey county is under construction and the board of tax levy of Hennepin county has been asked to appropriate $50,000 for this purpose.——

Murray and Lyon counties will build a joint tuberculosis sanatorium at a cost of $12,000.——St. Louis County Tuberculosis Sanatorium, Nopeming, has passed the inspection of the State Tuberculosis Advisory Commission whereby it receives an appropriation of $25,000 from the state.

MISSISSIPPI

New Officers.—Seventh District Health Officers' Association at Brookhaven, August 28: president, Dr. C. E. Catchings, Woodville; secretary, Dr. D. W. Jones, Brookhaven.

Fire Losses.—The home of Dr. R. A. Switzer, McHenry, was destroyed by fire August 28.——The offices of Drs. William H. Hanson and J. G. Backstrom, Tutwiler, were destroyed by fire, recently, with a loss of about $3,000.

Biennial Report of Health Board.—Dr. W. S. Leathers, University, state health officer, in his biennial report, gives minute details regarding the hookworm campaign, showing that during the last two years more than one hundred thousand patients have been examined, and ninety thousand have been treated, free of charge. Of this number forty-five thousand were children, 60 per cent. of whom were found to be infected and were cured. During the biennium, 13,623 examinations were made in the State Board of Health laboratory.

Urge Medical Inspection.—At a meeting of the Committee of Public Policy and Legislation of the Mississippi State Medical Association, with the State Board of Health, to discuss health problems of vital importance, a resolution was passed recommending "that the cities of Jackson, Meridian, Natchez and Vicksburg establish medical inspection of the public schools in these cities at the earliest possible date and that this work be so organized as to demonstrate to the people of the state the need and economic advantages of school inspection."

MISSOURI

New Officers.—Wright County Medical Society organized at Mountain Grove, August 5: president, Dr. Robert M. Rogers, Mansfield; secretary-treasurer, Dr. Ernest J. Butzke, Mountain Grove.

Personal.—Dr. Milton J. Hopkins, St. Louis, sustained a fracture of three ribs and possible internal injuries in a collision between an automobile and a street car, September 1. ——Dr. William H. Winningham, Trenton, who underwent operation in the Henrotin Memorial Hospital, Chicago, recently, is reported to be doing well.

Sanatorium Fund Completed.—The Missouri Baptist Sanatorium, St. Louis, has secured the subscription of $50,000 required for this endowment fund which enables it to take advantage of the $100,000 from the estate of the late Alanson T. Brown. A new building will be erected at a cost of $150,000 adjoining the present structure and this will double the capacity of the hospital.

Systematic Free Nursing for Poor Consumptives.—So that every individual consumptive in St. Louis may have nursing care as well as medical attention, the St. Louis Society for the Relief and Prevention of Tuberculosis inaugurated a plan of district nursing, September 1. Under the new plan, each of the nurses of the society will be assigned a certain district of the city in which she will work. More than one hundred physicians of the city have volunteered their services in this good work.

NEW JERSEY

Personal.—Dr. M. I. Marshak has succeeded Dr. Joseph Adler as city physician of Bayonne.——Dr. Thomas C. McNamara, Hoboken, who has been seriously ill as the result of accidental poisoning by bichlorid of mercury, is reported to have recovered.

Non-Restraint Policy Adopted.—The superintendent of the State Hospital of New Jersey has reported to the governor the adoption of the method of non-restraint for insane patients, which has been carried on so successfully at the Peoria State Hospital under the direction of Dr. George A. Zeller.

Medical Staff Appointments.—The Stumpf Memorial Hospital Association, Kearney, announced the appointments of medical staff as follows: Dr. A. A. Strasser, Arlington, medical director; Drs. W. E. Doremus, Arlington; James R. Bramley, Arlington; Howard Dukes, Henry Allers, Harrison; E. S. Goudy, Kearney; W. B. Reick, Arlington; Marcus F. Squier, Arlington; Alfred A. Mutter, Arlington; John W. Reid, Kearny, and Walter G. Mead, Arlington. It is expected that the hospital will be opened early in October.

NEW YORK

Personal.—Dr. and Mrs. Amos T. Baker, Riverdale, have sailed for Europe.——Dr. C. M. Campbell, White Plains, has returned from Europe.

Growth of the Work Against Tuberculosis.—The progress made in the campaign against tuberculosis in the state is evidenced by the fact, that $630,500 has been given by individuals for the construction of hospitals for the care and cure of those afflicted with tuberculosis. Mrs. Elizabeth Newton, Fredonia, left $150,000 for a tuberculosis hospital; Mrs. Samuel W. Bowne, New York City, has given $100,000 for the construction of the Samuel W. Bowne Memorial Hospital; Alexander Smith Cochran, Yonkers, $250,000, for the Spraine Ridge Sanatorium for Incipient Cases and a site for the Municipal Hospital for Advanced Cases, valued at $8,000; B. B. O'Dell, Jr., Newbury, $25,000 for a tuberculosis hospital for Orange County; H. N. Adam, Buffalo, a site valued at $19,000, for a municipal tuberculosis sanatorium; anonymous donors, $60,000 for a tuberculosis division of the Albany Hospital; Mr. and Mrs. Charles E. Rayelyea, a site valued at $10,000 for the Elmira State Hospital; Robert H. Treaman, Ithaca, $5,500 for a site and part of the cost of the construction of the Tompkins County Tuberculosis Hospital; General H. W. Carpentier, Albany, 275 acres of land as a site and $2,000 toward the cost of the Saratoga County Hospital, and the late S. R. Bradley, Nyack, $1,000 to be applied to the Rockland County Tuberculosis Hospital.——Oswego County Tuberculosis Hospital, Orwell, erected at a cost of nearly $20,000, has been formally accepted by the board of supervisors. The institution is practically completed and will accommodate about thirty patients and is to be in charge of Dr. A. R. Allen, Orwell.

New York City

Travelers by Sea.—Dr. and Mrs. L. Faugeres Bishop, Dr. and Mrs. A. L. Smith, and Dr. Charles L. Dana, have recently arrived from Europe.——Dr. and Mrs. A. B. Berk have sailed for Panama.——Dr. and Mrs. L. Kast have returned from Europe.

Examiners of Defective Children Certified.—President Churchill of the New York Board of Education has received the following list of those certified as eligible for appointment as examiners of mentally defective children: Drs. Jacob T. Krause, Joseph G. Wilson, Harold W. Wright, Frank P. Jenks, Isabelle T. Lenart, Mary Appleton, Alice Leeder and Elsie Fox.

No Quarter for Cocain Users.—Five cocain users taken in a raid recently were sentenced to imprisonment for periods of from three to six months. One of the prisoners claimed that he used cocain because of suffering from tuberculosis of the spine but this brought him no clemency from the judge. One individual was sentenced to six months in the penitentiary for selling cocain to newsboys.

Lower City Death Rate.—The death rate for the week ended August 30 was 12.37 per 1,000 population, as against a rate of 13.28 for the corresponding week of last year. There was an increase in the number of deaths from measles, diphtheria, croup and whooping cough, but a decrease in the number of fatal cases of typhoid fever, there being but seven deaths due to this disease as compared with 19 for the corresponding week of 1912.

Personal.—Dr. Calvert M. DeForrest has been appointed deputy health officer of the Port of New York. Dr. DeForrest has just returned from Libau, Russia, where he has been in the Public Health Service for the last five years.——Dr. Howard C. Taylor was shot at by a disappointed or demented patient, August 22, but was uninjured.——Dr. T. L. Jones has accepted the position of surgeon to a mining and railroad hospital in Peru and sailed for his new post of duty, August 16.

NORTH DAKOTA

Good Work of State Sanatorium.—The State Tuberculosis Sanatorium, Dunseith, has so many applicants for admission that it has been necessary to erect a new cottage. The administration building is now being used for ward purposes for women, and male patients are being cared for in a cottage. The institution at present accommodates about fifty patients and the average weekly cost is $10.50 per patient.

Hospital News.—St. Joseph's Hospital is to be built at Minot by the Sisters of St. Francis at an approximate cost of $80,000. The building will be three stories in height, 200 by 42 feet, and will accommodate one hundred patients.——The new building of the State Hospital, Jamestown, is to be four stories in height, including a basement. It will be used as a ward building and will eventually be able to accommodate more patients by the construction of temporary wings at each end of the building.

OHIO

State Association Meeting.—The sixty-eighth annual meeting of the Ohio State Medical Association was held in Cedar Point, September 2-4, and the following officers were elected: president, Dr. George A. Fackler, Cincinnati; president-elect, Dr. John H. J. Upham, Columbus; secretary-treasurer, Dr. C. D. Selby, Toledo (reelected); chairman of the legislative committee and member of the legislative council, Dr. B. R. McClellan, Xenia; councilors, Drs. Clyde E. Ford, Cleveland, and Wells Teachnor, Columbus; delegates to the American Medical Association, Drs. Charles Graefe, Sandusky; W. D. Porter, Cincinnati; Charles L. Minor, Springfield; B. R. McClellan, Xenia; W. William Means, Columbus, and E. O. Smith, Cincinnati. Columbus was selected as the next place of meeting.

PENNSYLVANIA

Danville Hospital Cornerstone Laid.—With the grand officers of the Free and Accepted Masons in charge, the cornerstone of the $200,000 George F. Geisinger Memorial Hospital was laid in Danville, September 1. The hospital, a building to cost $200,000 and an endowment of $600,000, are given by Mrs. A. A. Geisinger, widow of the man for whom the new institution is named.

Philadelphia

Death of Wife of Dr. Montgomery.—Mrs. E. E. Montgomery died at her home, September 7, after a prolonged illness.

The Curtin Alumni Scholarship.—An appeal for funds has been issued by the Philadelphia Alumni Society of the medical department of the University of Pennsylvania to endow the scholarship intended to honor the memory of the late Dr. Roland G. Curtin. Remittances may be made to the treasurer of the fund, Dr. L. H. Adler, Jr., 1610 Arch Street.

Typhoid Fever.—Forty-seven new cases of typhoid fever developed in the city during the week ended September 6, a decrease of twenty-seven from the number reported to the Bureau of Health during the previous week. This is the least number recorded for any week since the first of August. Most of the cases are in the downtown and river wards and, according to Chief Vogleson, swimming in the Delaware and Schuylkill rivers is a source of infection. Analyses of the city water at the entrance to the mains from the filter plant have continued to show pure water, free from pollution, but analyses of water at the spigots in the river wards show pollution.

GENERAL

Roentgenologists Meeting.—The fourteenth annual meeting of the American Roentgen-Ray Society will be held in Boston, October 1-4. Lantern slide demonstrations will be an important feature of the proceedings and the plate exhibits promise to exceed all previous exhibits in size and illumination facilities.

More Hospitals for Cuba.—We learn from *Consular Reports*, August 7, that the cabinet of Cuba has granted the demand of the Department of Sanitation for forty new hospitals for the island. They are to be paid for from the lottery fund. A bill granting an appropriation of $65,000 for establishing a hospital at Guantanamo has also recently been signed by the president of the republic.

Hospital Officials Meet.—At the annual meeting of the American Hospital Association in Boston, August 28, the following officers were elected: president, Dr. Thomas Howell, New York City; vice-presidents, Dr. H. E. Webster, Montreal; Miss Mary A. Baker, Jacksonville, Fla., and Miss Mary Rogers, St. Louis; secretary, Dr. H. A. Boyce, Kingston, Ont., and treasurer, Mr. Asa Baker, Chicago (reelected).

Bequests and Donations.—The following bequests and donations have recently been announced:

Presbyterian Hospital, New York City, $5,000 by the will of Mrs. Jane Elizabeth Grannis, for the endowment of a bed in memory of her mother; St. John's Guild, $1,000, and Daisy Fields Memorial Hospital, $1,000.

St. Vincent's Hospital, New York City, $1,000 by the will of Elizabeth Varet.

German Hospital and St. Francis Hospital, New York City, each $5,000 by the will of Joseph Keder.

Military Surgeons to Meet.—The twenty-second annual meeting of the Association of Military Surgeons of the United States will be held in Denver, September 16-19, under the presidency of Surgeon William C. Braisted, U. S. N. An unique feature of the program is that one session of the association is to be held in a natural amphitheater at Red Rocks, Morrison, and another on the Continental Divide at Corona. The headquarters will be at the Brown Palace Hotel.

Meeting of Electrotherapeutists.—At the twenty-third annual meeting of the American Electrotherapeutic Association, held in New York City, September 2-4, the following officers were elected: president, Dr. George E. Pfahler; vice-presidents, Drs. Albert C. Geyser, New York City, Frank B. Granger, Boston; John W. Torbett, Marlin, Tex.; William L. Clark, Philadelphia, and Fred C. Tice, Roanoke, Va.; treasurer, Dr. Emil Heuel, New York City (reelected); secretary, Dr. J. Willard Travell, New York City (reelected), and lecturer, Dr. Fred M. Law, New York City (reelected).

Harvey Society.—The lectures of the Harvey Society for the coming winter include among others, Prof. A. D. Waller, London; Prof. Adolph Schmidt, Halle, Germany; Dr. Charles V. Chapin, Providence, R. I.; Dr. Rufus Cole, Rockefeller Institute; Prof. G. H. Parker, Harvard; Dr. Victor C. Vaughan, Ann Arbor, Mich.; Prof. Sven G. Hedin, Upsala, Sweden, and Prof. J. J. R. Macleod, Western Reserve University, Cleveland. The course will be inaugurated on October 4 by a demonstrative lecture by Dr. Waller, entitled "A Short Account of the Origin and Scope of Electrocardiography."

Colored Medical Men Meet.—At the fifteenth annual meeting of the National Medical Association, whose membership is composed of colored physicians, dentists and pharmacists, held in Nashville, August 26-28, the following officers were elected: president, Dr. A. M. Brown, Birmingham; vice-presidents, J. M. G. Ramsey, Richmond, Va., and O. La Branch, New Orleans; secretary, Dr. W. G. Alexander, Orange, N. J., (reelected) and treasurer, Dr. J. R. Levy, Florence, S. C. Officers elected for the medical section were Dr. J. R. Levy, Florence, S. C., president, and Dr. A. M. Tennant, Richmond, Va., secretary, and for the surgical section, Dr. N. L. Edwards, Bluefield, W. Va., president, and Dr. N. E. Cashin, Decatur, Ala., secretary.

Radium Apparatus Stolen.—Dr. F. L. de Verteuil, Royer's Building, Vancouver, B. C., writes that there was stolen from his office a few days ago, a radium apparatus. It was a flat, varnished apparatus from the Paris Radium Institute, 2½x3 cm., containing the equivalent of 60 milligrams of radium bromid of 500,000 activity. The apparatus was a silver disk on the back of which was the number "500." Filling the disk was the varnish, with the dissolved radium. The apparatus had been previously damaged and as the result the varnished surface was covered with small flakes of asbestos sticking to the varnish. A corner of the silver disk had a small dent in it. The apparatus was wrapped in several sheets of metallic lead, this being covered with black paper and rubber cloth over this. Should any reader of The Journal be offered a radium apparatus of the above description, Dr. de Verteuil requests that he may be notified at the earliest moment.

American Mine Safety Association.—An interesting program has been prepared for the meeting of the American Mine Safety Association at Pittsburgh, September 22-24, which was mentioned in The Journal of August 30. The meeting promises to be very largely attended. Prizes have been offered for men who compete in showing their skill in doing rescue work and recovery work at mines. Among the prizes are an oxygen inhalator and a miner's electric cap lamp, and medals for the individual contestants. A first-aid contest, similar to those held elsewhere in mining regions, is to take place and the prizes for this include first-aid cabinets and a first-aid instruction outfit and medals from the American Red Cross and American Mine Safety Association. An experimental explosion exhibit is to be given by the Bureau of Mines at their mine at Bruceton on September 23, which will enable those interested to see just exactly what caused the explosion, how the explosion acts, and the speed, pressure and other important items will be automatically recorded in the instrument room. A number of rescue men fitted with artificial breathing apparatus will enter the mine immediately after the explosion so as to illustrate how they can do rescue work in a mine while smoking and full of gas, immediately after disaster. On the evening of September 23 a smoker is to be given in the Fort Pitt Hotel to the visiting mining men.

Civil Service Examination for Chief Bacteriologist (Male).—The United States Civil Service Commission announces an open competitive examination for chief bacteriologist, for men only. From the register of eligibles resulting from this examination certification will be made to fill a vacancy in this position in the Bacteriological Laboratory of the Bureau of Chemistry, Department of Agriculture, Washington, D. C., at $3,500 a year, and vacancies as they may occur in positions requiring similar qualifications, unless it is found to be in the interest of the service to fill any vacancy by reinstatement, transfer or promotion. The duties of this position will be to direct all bacteriological and a portion of the fermentation work of the Bureau of Chemistry; to direct the work necessary in controlling the bacteriological purity of interstate shipments and importations of foods; to carry on all investigations of a bacteriological nature connected with the enforcement of the Food and Drugs Act, and to carry on other investigations connected with the agricultural chemical work carried on by the Bureau of Chemistry. Competitors will not be assembled for examination, but will be rated on general education and scientific training with 40 weights; practical experience and fitness with 30 weights, and publications along bacteriological and pathological lines with 30 weights. An educational training equivalent to that required for an M.D. or Ph.D. degree from a college or university of recognized standing, and at least seven years' practical experience in bacteriological and pathological work involving original investigations, since receiving such degree, are prerequisites for consideration for this position. Statements as to training, experience and fitness are accepted subject to verification. Applicants must have reached their thirtieth but not their fiftieth birthday on the date of the examination. Applicants for this examination must have been actually domiciled in the state or territory in which they reside for at least one year previous to the date of the examination. Recently the commission has obtained an appropriation whereby it is now able to have as examiners on various scientific, technical and professional subjects men who are recognized authorities in such subjects. In passing on the qualifications of candidates in this examination, the commission will have the assistance of an expert examiner who has been thus secured. This examination is open to all men who are citizens of the United States and who meet the requirements. Persons who meet the requirements and desire this examination should at once apply for Form 304 and special form to the United States Civil Service Commission, Washington, D. C.; the secretary of the Board of Examiners, Postoffice, Boston, Mass., Philadelphia, Pa., Atlanta, Ga., Cincinnati, Ohio, Chicago, Ill., St. Paul, Minn., Seattle, Wash., San Francisco, Cal.; Customhouse, New York, N. Y., New Orleans, La., Honolulu, Hawaii, Old Customhouse, St. Louis, Mo., or to the chairman of the Porto Rican Civil Service Commission, San Juan, P. R. No application will be accepted unless properly executed and filed with the commission at Washington with the material required, prior to the hour of closing business on October 6, 1913. In applying for this examination the title "United States Civil Service Examination for Chief Bacteriologist (Male)" should be used.

CANADA

Annual Report of Hospitals for the Insane, Ontario.—The total number of insane in the hospitals of Ontario is 5,726, of whom 2,769 are male and 2,957 female, an increase over the previous year of 86. The admissions for the past year numbered 1,247, an increase of 103. There were 460 deaths and 570 discharged. The deportations numbered 258, an increase of 32. Insanity in the province cost nearly $1,000,000 annually. Commencing with the cycle of five years, 1882 to 1886, the growth of insanity in Ontario has been as follows: 2,775, 3,201, 3,865, 4,604, 4,933, 5,517. Of the 1,247 admitted in one year, 890 inherited a predisposition.

Annual Meeting Ontario Medical Council.—At the recent annual meeting of the Ontario Medical Council Dr. M. O. Klotz, Ottawa, was elected president, and Dr. John L. Bray, 170 University Avenue, Toronto, was reelected registrar. The names of two practitioners were struck from the register. Sir James Grant, Ottawa, having attained to his forty-eighth year of membership of the council, was moved a hearty resolution of congratulations. A resolution was adopted instructing the registrar of the Ontario Medical Council to accept Dominion registration as full qualification for license in Ontario, subject only to the production of the necessary credentials and payment of the usual fee.

What Toronto Is Doing in Tuberculosis Nursing.—In the year 1911 the sanatorium accommodation for Toronto patients was 153; Island Preventorium, 25; dispensaries, three clinics a week with an average attendance of about six. In May, 1913, the sanatorium accommodation had reached 270; Island Preventorium, 50; Daughters of the Empire Preventorium, 10; Forest School, 100; dispensaries, six clinics a week with Department of Health nurses in charge with an average daily attendance of 15. Since this work was established in Toronto in 1911 in connection with the Department of Health, 2,272 cases have been recorded. Of these 97 had no medical supervision; 1,019 were at some time under the supervision of dispensaries and 1,156 were under the supervision of private physicians. In May, 1913, 281 physicians have reported 1,202 cases, with 102 duplicates. The classification is as follows: Advanced, 361; moderately advanced, 449; incipient, 283; not classified, 190; arrested, 21; reported for supervision, 893; no supervision necessary, 309; reported by physicians, 870; reported by dispensaries, 332. One hundred and thirty-five physicians who are known to have treated positive pulmonary cases have not yet reported one case; 868 cases have been reported first by nurses and others not qualified to make a diagnosis, and of these 131 have since been reported by physicians.

LONDON LETTER

(From Our Regular Correspondent)

London, Aug. 30, 1913.

The Prevalence and Preventability of Venereal Diseases

A report on this subject by Dr. R. W. Johnstone, a medical inspector of the Local Government Board, has been issued as a parliamentary paper. The deaths specifically registered as due to syphilis show a gradual and steady decrease from 89 per million in 1875 to 46 in 1910. It is considered doubtful, however, whether these figures are a reliable indication of the prevalence of the disease. Opinions collected from numerous specialists and physicians agree that there is as large or a larger proportion of syphilis as there was twenty years ago, but that the grosser lesions are less frequent than formerly. Moreover, there is no indication of a fall in the death-rates from disease caused by syphilis, such as locomotor ataxia, general paralysis of the insane, and aneurysm. On the other hand, army statistics show a remarkable diminution in the number of recruits rejected on account of syphilis, which has fallen from 158 per ten thousand in 1870 to 19 in 1911. Much syphilis is spread by infected males in consequence of ignorance or carelessness. The desire for concealment causes them to resort to quacks and pharmacists. Means for hospital treatment are defective. As a general rule no beds are reserved for venereal cases and lay managers often adopt the attitude that hospital funds should not be used to rescue patients from the consequences of sin. The report emphasizes the great advantage which would accrue if the necessary accommodations were provided in special wards in our general hospitals and free tests, such as the Wassermann, Noguchi, gonococcus and spirochete, were available. The time for making venereal disease notifiable is not considered to be ripe. The stigma attached to it is so great and the desire for concealment so marked that notification would prevent patients seeking medical advice.

Sir Jonathan Hutchinson's Will

Sir Jonathan Hutchinson left an estate of the value of $460,000, the bulk of which is divided among his eight children. He wrote the following directions in his will: "I desire to be buried in the same grave with my late beloved wife, the inscription on the gravestone to be, in addition to the names and dates, 'A Man of Hope and Forward-Looking Mind.'" He left his three museums, his clinical museum in London and his educational museums at Haselmere and Selby, to trustees to dispose of in their absolute discretion, but he stated his desire that they shall do so in accordance with his wishes expressed to them during his life.

BERLIN LETTER

(From Our Regular Correspondent)

Berlin, August 22, 1913.

Personal

Professor Bier and Professor Körte have been named as honorary members of the Royal College of Surgeons in London.

Professor Hering of Prague has accepted a position as dean of the newly organized institute for pathologic physiology in Cologne.

On August 26, Dr. W. A. Freund, formerly a well-known professor of gynecology at Strassburg, who has for the last ten years made his home in Berlin, celebrated his eightieth birthday.

Protection Against Cholera

In order to be forearmed so that Germany might not suffer through the bringing in of cholera from the Balkan countries, the German government has taken definite steps toward the prevention of such entrance. Thus the trains which come from the Balkan countries and Austria have been carefully searched for persons with signs of cholera. Since the great epidemic in Hamburg, through the teachings of Koch, cholera has been kept from Germany. We may hope that this time again she may be protected from such an epidemic. Two bacteriologists from Berlin, moreover, have been invited by the Servian government to the capital, in order to aid the physicians in making positive diagnosis.

Feeding of Schoolchildren

For the last five years needy children of the Berlin public schools have been fed through the use of a fund voted by the city magistrates. The importance of this step is shown by the facts, now published by a magistrate, that daily 1,300 children have had no breakfast and 7,000 have had no lunch at home. Each year a sum of from $25,000 to $50,000 has been voted for this purpose.

A Mesothorium Concert

The directors of the clinics and of the city hospitals have been endeavoring because of various publications concerning the favorable action of mesothorium on cancer, especially cancer of the uterus, to secure some of this preparation for clinical use. The state and various public officials and private committees as well have been endeavoring to raise money to buy a sufficient quantity of this preparation. In Munich at the initiative of Professor Döderlein, a concert was proposed, the proceeds of which should be used for this purpose. The prices paid by subscription for the tickets for this concert have been as much as $25. The various clubs and trade unions have promised their assistance so that there is hope that by means of the power of music, a sufficient quantity of mesothorium may be purchased.

Sanitary Conditions in the French and German Navies

In the last number of the *Deutsche militärärztliche Zeitschrift* an army surgeon presents comparative studies on the sanitary conditions in the French and German navies with especial reference to tuberculosis. He shows that the German marines are in better condition than the French as shown by the markedly lower annual morbidity and still lower mortality, and in the rarity of dismissal for unfitness for service on account of tuberculosis and suspected tuberculous disease. The physical inferiority of the French marines depends chiefly on the greater frequency of tuberculosis and is explained by the low standard of physical capacity required of recruits. This is chiefly due to the prevalence of tuberculous infection among the population along the French seacoast and also to the lack of adequate military reserves on account of the insufficient increase in the population.

Miscellany

Interstate Quarantine Regulations Regarding Water and Ice Supplied by Interstate Carriers.—The secretary of the treasury as authorized by Congress has amended the regulations in regard to the water and ice supplied by interstate carriers for the use of passengers in the following respects: The state or municipal health authority within whose jurisdiction water is obtained shall certify that it does not carry disease; in case of doubt the water must be treated so as to make it safe, and the treatment must be certified by the health officer. Ice for cooling water must also be certified to be safe, and if it is to be placed in the water it must first be washed carefully in water known to be safe and handled in such a way as to prevent it from becoming contaminated by the organisms of infectious or contagious diseases. To aid the common carriers in carrying out this regulation, instructions have been issued to the effect that samples of water and artificial ice from every source of supply shall be subjected to bacteriologic examination and certified as to purity at least once every six months by the proper state or municipal health authority where the water is obtained, or by such competent persons as will be approved by the health authorities, and the common carrier shall make application for the certificate. Each new crop of natural ice shall be examined and certified before use. Copies of the certificates are to go to the Public Health Service, to the common carrier and to the files of the issuing authority. Whenever there is an unusual prevalence of typhoid fever, dysentery, infantile diarrhea or other water-borne disease in any locality from which common carriers receive water and ice, an additional examination of the water and ice is to be made and a supplemental certificate issued by the proper authority. These regulations in regard to the safety of the drinking-water for the use of passengers on trains, vessels, etc., if carefully carried out, in connection with the abolition of the public drinking-cup, should do much to safeguard the public from dangerous diseases.

The Careless Liver and the Hygienist.—The average careless liver, although he may be perfectly willing to swallow some "magic" elixir, exhibits uneasiness tinged with suspicion when approached on the subject of prolonging his life by means of adjusting himself to his environment. He feels that the span of life is fixed, and he cherishes but little hope of "beating the game." In other words, that convenient individual, the "man on the street," is skeptical about materially prolonging his life without surrendering some of the indulgences which he thinks make life worth living. It is this attitude of mind which leads him frequently to characterize the health-reformer as a "kill-joy," who is "against everything." . . . But it is far from the minds of those directing this new force of human betterment to advocate a mere niggardly or parsimonious hoarding of existence, without regard to its quality, color or meaning. The real warfare is against needless misery, preventable disease, mental and physical inefficiency, and the pitiable handicaps that not only shorten life, but take out of it the color and the satisfaction that make it worth living. Using the term in no sinister Nietzschian sense, the superman should not only live long, but live well, deriving his joy in life from the normal hormones circulating in his tissues, and not from the fleshpots or narcotic indulgences of our friend, the careless liver. The prolongation of life is the end that justifies the means, and the immediate work in hand is to make life more livable.—Eugene L. Fisk, in *Pop. Sc. Monthly.*

Study of the Pathology of the Living.—When we consider the crushing disadvantages under which our forebears worked it is amazing to find how much they did, and with what accuracy they had solved many problems. The most conspicuous example of this extraordinary insight into abdominal diseases is, I think, afforded by the work of Brinton, whose books on "Diseases of the Stomach" and on "Ulcer of the Stomach" for wide observation, profound and cogent reasoning and beauty of language have never been challenged by those of any other writers. But with the new methods to which I have referred the study of the pathology of the living became possible. Symptoms recited at the moment could be ascribed to the lesion disclosed by the operation in the precise stage of its existence in which it was capable of arousing those symptoms. The history of abdominal surgery in the last ten years is the tale of the lessons that were learned.—Sir Berkeley Moynihan, Address in Surgery. Brit. Med. Assn., 1913.

Value of "Civic Health."—In our present enlightenment, men seeking homes and manufacturers casting about for the location of industries are more and more making healthfulness a prerequisite to their selection. A great industrial company, contemplating a change in location for their plant, sent a committee of intelligent workmen to inspect the town under consideration. The committee gave an adverse report because they were unable to ascertain anything which was definite in regard to the health of the place and because the statements of citizens were conflicting.—Birth and Death Bookkeeping, bulletin issued by Association of Life-Insurance Presidents.

Marriages

Narcisse Albert Laurendeau, M.D., St. Boniface, Man., to Miss Eva Brule of Fremont, N. Dak., at Walhalla, N. Dak., August 20.

William Earnshaw Styan, M.D., Quincy, Cal., to Miss Lottie Christine Gansner of San Francisco, August 16.

Warren Garfield Murray, M.D., to Miss Marion Louise Macfarlane, both of Kankakee, Ill., August 31.

John Pickens Cunningham, M.D., to Miss Beulah Thompson, both of Elbridge, Tenn., August 25.

Egerton T. Wilson, M.D., O'Neil, Neb., to Miss Harriett E. Hunt of Owosso, Mich., August 23.

Edward F. Duffy, M.D., Yonkers, N. Y., to Miss Margaret Ward of New York City, August 12.

William K. Farley, M.D., Fulton, Ill., to Miss Sarah Sturges, at Dixon, Ill., August 16.

Will Hawes, M.D., Fairbury, Neb., to Miss Alice Neville of Hebron, Neb., recently.

Edward J. Deibert, M.D., to Miss Flora Bader, both of Helerton, Pa., August 5.

Sofie Herzog, M.D., and Mr. M. Huntington, both of Brazoria, Tex., August 23.

Deaths

Harris Otis Perley, Colonel, M. C., U. S. A., retired, died at Fort Preble, Portland, Me., August 9, from kidney disease, aged 60. He was a graduate of Detroit Medical College in 1876 and in the same year entered the Medical Corps of the Army. Among his most important duties during the 36 years of his army service, were the command of the Army and Navy General Hospital, Hot Springs; the command of the hospital ship *Relief* in the Philippines and during the Boxer War; his detail as medical officer on the academic board of the United States Military Academy, West Point, and as chief surgeon of the departments of Mindianao and Colorado; Colonel Perley was retired May 8, 1913, on account of disability, incident to the service and since his retirement had lived in Portland, Me. He was a fellow of the American Medical Association and until a short time before his death a member of the Association of Military Surgeons of the United States.

Joseph Benson Marvin, M.D. Hospital College of Medicine, Louisville, Ky., 1875; a fellow of the American Medical Association; president of the Kentucky State Medical Association in 1894; president of the faculty and professor of principles and practice of medicine and clinical medicine in the University of Kentucky, Louisville; president of the medical staff of Norton Infirmary, neurologist to the Louisville City Hospital and physician to the Baptist Orphan Home; one of the most prominent practitioners of Kentucky; was killed in a collision between the Bar Harbor Express and the White Mountain Express on the New York, New Haven and Hartford Railroad, near New Haven, Conn., September 2, aged 61. His wife and daughter were traveling with him and both were killed.

James Owen Callahan, M.D. Missouri Medical College, St. Louis, 1888; a fellow of the American Medical Association; a member of the Southwestern Tri-State, Western District and Indian Territory Medical associations; for fifteen years chairman of the Creek Medical Examining Board and the author of the first and only medical laws ever passed by the Creek National Council; died at his home in Muskogee, Okla., August 29, from heart disease, aged 53.

Paul Gervais Robinson, M.D. Medical College of South Carolina, Charleston, 1856; surgeon in the Confederate service during the Civil War and since the close of the war a practitioner of St. Louis; for many years professor of principles and practice of medicine in Washington University and dean of the faculty of the Missouri Medical College; died at his home in St. Louis, August 22, from heart disease, aged 79.

Benjamin F. Miller, M.D. Medical College of Ohio, Cincinnati, 1859; assistant surgeon and surgeon of the Second Ohio Volunteer Infantry and brigade surgeon on the staff of General Scribner during the Civil War; once assistant professor of anatomy in the Ohio Miami Medical College and a member of the staff of the Cincinnati City Hospital; died at his home in Hyde Park, Cincinnati, August 23, aged 83.

Ira N. Barnes, M.D. Jefferson Medical College, 1862; a fellow of the American Medical Association and once president of the Decatur Medical Society; surgeon of volunteers during the Civil War; a member of the Illinois Army and Navy Medical Association; once a member of the Board of Health of Decatur, Ill.; died at his home, August 16, from cerebral hemorrhage, aged 84.

Thomas Robinson, M.D. Georgetown University, Washington, D. C., 1876; immediately after the Civil War the owner and editor of the *Savannah Journal*; for more than forty years an employé of the Treasury Department at Washington, and at one time president of the Board of Examiners of the Eclectic Medical Association; died at his home in Washington, August 25, aged 77.

Emerson Pullen McGeorge, M.D. Hahnemann Medical College, Philadelphia, 1894; a member of the Medical Society of the State of New Jersey; formerly coroner of Gloucester County and for two terms coroner of Salem County; died at his home in Woodstown, August 12, from the effects of a gunshot wound of the head, self-inflicted, it is believed with suicidal intent, aged 46.

Jane E. Spaulding, M.D. New York Medical College and Hospital for Women, 1861; formerly of Larned, Kan.; said to have been the third woman granted a certificate to practice medicine in the United States; for twenty years superintendent of the Santa Barbara (Cal.) Hospital; died at her home in Santa Barbara, August 31, from arteriosclerosis, aged 81.

Francis Asbury Emmons, M.D. Rush Medical College, 1863; Illinois Army Board, 1863; for many years a member of the Board of Education of Chicago, and at one time physician of Cook County; major and surgeon of volunteers during the Civil War and chief surgeon of Camp Douglas; died at his home in Chicago, August 21, aged 74.

Alphonso H. Madry, M.D. University of Louisville, Ky., 1886; a fellow of the American Medical Association and president of the Southwest Missouri Medical Society; local surgeon at Aurora, Mo., for the Kansas City, Fort Scott and Memphis Railroad; died at his home in Aurora, August 24, from disease of the lungs, aged 53.

Melbourne F. Middleton, M.D. Homeopathic Medical College of Pennsylvania, Philadelphia, 1868; for twenty years a member of the Camden (N. J.) Board of Health and one of the founders of the West Jersey Homeopathic Hospital; died at his home in Camden, August 21, from cerebral hemorrhage, aged 71.

Thomas Langan White, M.D. Jefferson Medical College, 1875; president of the McKeesport and Duquesne Bridge Company, the White Electric Traction Company, the McKeesport Light Company and the Chamber of Commerce of McKeesport; died at his home in that city, August 24, from pleuropneumonia, aged 60.

Daniel Manly Breaker, M.D. Oglethorpe Medical College, Savannah, Ga., 1861; a practitioner and minister of the Christian Church for more than fifty years, and a chaplain in the Confederate service throughout the Civil War; died at his home in Kissimmee, Fla., August 15, from senile debility, aged 82.

George Emory Foster, M.D. College of Physicians and Surgeons, New York City, 1868; at one time a member of the common council of Springfield, Mass., and for 43 years a practitioner of that city; died in Mount Clemens, Mich., August 22, a day after an operation for appendicitis, aged 63.

William A. Jordan, M.D. College of Physicians and Surgeons, Baltimore, 1873; one of the founders of St. Francis Hospital, Wichita, Kan., and later a member of the staff of the Wichita Hospital; for five years a physician of Sedgwick County; died at his home, August 19, from heart disease, aged 67.

Henry Gers, M.D. Miami Medical College, Cincinnati, 1880; a member of the Indiana State Medical Association; for several years a trustee of the School Board of Washington, Ind.; for two sessions a state senator; died in a hospital in Evansville, August 22, after a surgical operation, aged 68.

Mary Jane Laird, M.D. Woman's Medical College of the New York Infirmary for Women and Children, New York City, 1885; a pioneer physician of the San Joaquin Valley, Cal., and for many years a practitioner of Fresno; died at her home near Sanger, Cal., August 15, aged 67.

Joel E. Morrill, M.D. Northwestern Medical College of St. Joseph, Mo., 1884; for 36 years a practitioner of Chapman, Neb., and district surgeon for the Union Pacific System; since 1910 a resident of Lincoln, Neb.; died at his home, August 15, from cerebral hemorrhage, aged 73.

Robert Osborne Treadwell, M.D. Jefferson Medical College, 1846; is said to have been the oldest alumnus of Harvard University; for several years professor of languages in the University of Barcelona, Spain; died at his home in Portsmouth, N. H., August 23, aged 90.

Charles H. Zorger, M.D. Illinois Medical College, Chicago, 1897; a fellow of the American Medical Association; formerly a practitioner of Champaign and later a resident of Bloomington, Ill.; died at the home of his brother in Champaign, August 23, from nephritis, aged 46.

William Shuler, M.D. University of Pennsylvania, Philadelphia, 1867; a veteran of the Civil War; for 25 years a member of the Examining Board of Pensions and for two terms a member of the State Legislature; died at his home in Miamisburg, Ohio, August 11, aged 70.

William Wyatt Wiley, M.D. University of Maryland, Baltimore, 1871; local surgeon of the Baltimore and Ohio System at Cumberland, Md., for many years and formerly water commissioner of Cumberland; died at his home, August 26, from gangrene of the foot, aged 64.

Samuel Eldridge Ewing, Jr., M.D. Jefferson Medical College, 1902; at one time resident physician of the New Cape May Hotel; a member of the Medical Society of the State of New Jersey; died at his home in Tuckahoe, N. J., August 23, from acute gastritis, aged 35.

Homer Frank Parr, M.D. Medical College of Indiana, Indianapolis, 1903; a fellow of the American Medical Association; who went to New Mexico about eight years ago on account of ill health; died at his home in Carlsbad, August 18, from typhoid fever, aged 34.

Isaac Newton Boyd, M.D. College of Physicians and Surgeons, Baltimore, 1880; for seven years thereafter a teacher in the York Haven School and for twenty years a practitioner of Goldsboro, Pa.; died at his home, August 21, from heart disease, aged 60.

Abraham Iralson, M.D. Barnes Medical College, St. Louis, 1900; a fellow of the American Medical Association and a practitioner of Clifton Heights, St. Louis; died in the Deaconess Hospital in that city, August 2, from heart disease, aged 38.

David F. Penington, M.D. Maryland Medical College, Baltimore, 1885; for twenty years president of the Masonic Relief Association of Baltimore and a resident of that city until 1902; died at his home, August 16, from acute gastritis, aged 66.

Frederick Fenton, M.D. Trinity Medical College, Toronto, 1892; for many years a member of the gynecologic and obstetric faculty of the University of Toronto; died July 27, from peritonitis, following an operation for appendicitis, aged 42.

Everett E. Gordon, M.D. Homeopathic Medical College of Missouri, St. Louis, 1897; of Cairo, Ill.; was shot and killed by the son of a patient, at the entrance of the drive leading to St. Mary's Hospital, Cairo, September 1, aged 40.

John Reineking, M.D. Rush Medical College, 1887; Bellevue Hospital Medical College, 1888; a member of the Wisconsin State Medical Society; died at his home in Hortonsville, Wis., May 27, from carcinoma of the stomach.

Smith Rumble, M.D. Atlanta (Ga.) Medical College, 1887; a fellow of the American Medical Association and one of the leading practitioners of Pike County, Ga.; died at his home in Barnesville, August 20, aged 54.

William Henry McCarthy, M.D. College of Physicians and Surgeons, Baltimore, 1891; a member of the Massachusetts Medical Society; of Brockton; died in that city, about August 22, from appendicitis, aged 70.

James W. Bunn, M.D. Starling Medical College, Columbus, Ohio, 1873; a member of the Ohio State Medical Association and a veteran of the Civil War; died at his home in West Union, August 26, aged 71.

Thomas E. Stone, M.D. Tulane University, New Orleans, 1893; a member of the State Medical Association of Texas; died at his home in Jasper, August 18, from carcinoma of the throat, aged 53.

Samuel G. Bailey, M.D. Jefferson Medical College, 1844; for more than forty years a practitioner and banker of Chicago; died at his home in that city, June 20, aged 92.

John Alvin Leitch, M.D. Harvard Medical School, 1887; died at his home in Andover, Mass., August 26, from diabetes, nephritis and cerebral hemorrhage, aged 48.

The Propaganda for Reform

In This Department Appear Reports of the Council on Pharmacy and Chemistry and of the Association Laboratory, Together with Other Matter Tending to Aid Intelligent Prescribing and to Oppose Medical Fraud on the Public and on the Profession

STANDARDIZING DISINFECTANTS

American Medicine Attacks the Hygienic Laboratory and the Council on Pharmacy and Chemistry

A report adopted by the Council on Pharmacy and Chemistry on "Standardization of Disinfectants," appeared in these columns April 26, 1913. The report was submitted by a committee appointed to consider the question of the recommendation of a method for standardizing disinfectants. The subject was gone into with thoroughness, the three leading methods—the Rideal-Walker, the *Lancet* and the Hygienic Laboratory methods—being carefully considered by the committee, which, as a result of its investigation, recommended to the Council the adoption of the Hygienic Laboratory method as described in the government publication, Hygienic Laboratory *Bulletin 82*.

After the publication of the Council's report, Mr. Walker, in a letter to *American Medicine*, defended his own method of standardization and protested against the report adopted by the Council. This was natural.

Of Mr. Walker's defense, we shall, at this time, have nothing to say. In the same issue of *American Medicine* which contains Mr. Walker's letter, however, that publication rushes to Mr. Walker's defense, editorially, and attacks, not merely the Council's report, but also the motives of the members of the Council on Pharmacy and Chemistry and, inferentially, of Dr. Anderson of the Hygienic Laboratory. That *American Medicine* should attack the Council is the most natural thing in the world; for the animus, one need look no further than its advertising pages. But its attack on the Hygienic Laboratory and its officers is different and aroused the indignation of the *Old Dominion Journal of Medicine and Surgery*, which, in its July issue, makes some comments that are worth quoting.

After stating that Mr. Walker, in his letter, makes no charges other than those which might naturally arise between disputants, the *Old Dominion Journal of Medicine and Surgery* goes on:

> "In commenting on Mr. Walker's letter, however, the editor of *American Medicine* takes an entirely different position, and makes statements and insinuations, which, if true, should receive prompt attention, and which, if untrue, should be as promptly withdrawn. Briefly, the editorial charges that the criticisms of the Rideal-Walker method have been dictated by a desire to promote 'a certain other test,' supposedly the Hygienic Laboratory method, and more serious still to 'further the use of a well-known antiseptic.' 'The situation is not a pleasant one to contemplate,' he states, 'for it suggests all too plainly reasons sordid and unsavory. Right always prevails, however, and we feel confident that when the true facts come to light Mr. Walker will find that the unpleasant experiences to which he has been subjected are simply the work of a few, who, instead of representing the great body of scientists of America, represent no one but themselves and their own selfish purposes.'
>
> "In considering this rather remarkable example of skating on the thin edge of libel, the facts should be kept carefully in mind. The scientific aspects of the question need no discussion at this time; the relative merit of the two methods is a matter capable of easy determination by a few months' practical application of both, and will doubtless settle itself promptly. In considering the alleged effort to discredit Mr. Walker and his method, and the discourtesies and difficulties he is said to have encountered, it should be remembered that since coming to America Mr. Walker has been in the employ of a manufacturer of disinfectants, and his status has been necessarily that of a hired advocate rather than that of a disinterested scientist. Whatever the conditions in England, we have come in America to accept the researches of scien-

tists connected with our universities and governmental agencies rather than those employed by private concerns. We shall doubtless continue to do so for some time to come.

"The charge that Mr. Walker's method has been discredited to boost the sale of a rival disinfectant is so serious as to warrant that some proof be promptly brought forward or else that the charge be withdrawn. Even here, however, we must take into account the fact that the publication in which the editorial appears carries a half-page advertisement of the very concern to which Mr. Walker sells his service.

"Those who know the officers of the Public Health Service, particularly Dr. Anderson, and who knew Dr. McClintic before he laid down his life to science, will pay but little heed to such charges until something more definite is forthcoming from some source whose disinterestedness can at least be presumed."

Summing up the whole matter, it resolves itself into this: *American Medicine* attacks, by inference, Dr. Anderson of the Hygienic Laboratory; further, it berates the Council on Pharmacy and Chemistry, a body which has had to expose the fraudulence of many, if not most, of the proprietary remedies from which *American Medicine* receives a large proportion of its advertising income; in addition, it exhibits a warmth of feeling in championing Mr. Walker and his method that may or may not be due to the fact that the concern which employs Mr. Walker and which manufactures and sells a disinfectant "standardized by the Rideal-Walker Test," is a purchaser of advertising space in *American Medicine*.

For a publication whose journalistic ethics rise no higher than the counting-house and whose editorial policy seems to be subservient to the advertising department; which exploits for a consideration—such proprietary frauds as Bannerman's consumption cure, Anasarcin, Phenol Sodique, Sal Hepatica, Cactina Pillets, Phenalgine, et al.; which publishes what seem to be editorial endorsements of some of the humbugs it advertises—for such a publication to attack, even by inference, the methods of such men as constitute the Council on Pharmacy and Chemistry and the Hygienic Laboratory, is to go beyond the limits of mere journalistic impertinence and to approach the realm of refined blackguardism.

DISEASE SUPERSTITIONS

As They Appear to Harper's Weekly

The belief is common among primitive and unlettered people that there is a specific remedy that will cure every disease of the body, if it can only be found.

Ignorant and superstitious people are peculiarly and pathetically susceptible to the persuasion of quacks who profess to have found the healing herb for their particular disease, and will go on squandering money and health after being defrauded a dozen times, because in their simple and pitiful faith they think each time, "Now, maybe, this man has found the real herb that will end my suffering."

This credulity is a matter for patient teaching. The health of the people is a national asset beyond the measure of dollars, but even the economic loss from avoidable sickness and death runs into unbelievable figures. The people must be carefully taught—not casually told—that disease is not an accident, not a dispensation of Providence or the infliction of an evil spirit, but the result of environment and of the mode of living. They must learn that health does not return by magic or by magic compounds; but it must be restored by a personal battle against disease.

Generous physicians, newspapers and journals, and social workers who are giving their time and means to fight the powers to prey and to spread the gospel of health, realize that education is slow. Thousands are saved every year, but it will take a long, strong effort to reach all the people with the truth. If ever there was an unselfish effort, and one of supreme importance to the country, it is the battle for national vitality.

What about the national health department at Washington?

—*Harper's Weekly*.

Queries and Minor Notes

Anonymous Communications will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

QUESTIONS OF ETHICS

To the Editor:—Please answer the following questions:

1. Is it justifiable for a consultant to withdraw from the other physicians and hold a private conversation with a member of the patient's family?

2. Is a consultant ever justified in entering on a controversy with the attendant in the presence of the patient?

3. When the consultant takes charge of a patient because of a difference of opinion that he holds from that of the attending physician, is it proper for him to ask the physician whether or not the latter has relinquished the care of the patient? If this question is asked should it be in the presence of a third party, a layman?

X. Y. Z., South Carolina.

Answer.—In answering these questions it must be remembered that our reply is a general one. In any particular case both sides to the dispute should be heard before judgment is announced.

1. "In every consultation, the benefit to be derived by the patient is of first importance. All physicians interested in the case should be frank and candid with the patient and his family. There never is occasion for insincerity, rivalry or envy and these should never be permitted between consultants" ("Principles of Medical Ethics," Sec. 2, Art. III, Chap. II). While it is best that all consultants avoid "private conversations" with members of the patient's family during the consultation, the relations of one of the physicians with some of the friends of the patient may make such a talk unavoidable. Should the physician have the least suspicion that he does not have the absolute confidence of the others interested in the case, he will do well casually to report his interview and state the nature of such discussion during the conference of the consultants.

2. "Should the attending physician and the consultant find it impossible to agree in their views of a case, another consultant should be called to the conference or the first consultant should withdraw. Since, however, the consultant was employed by the patient in order that his opinion might be obtained, he should be permitted to state the result of his study of the case to the patient, or his next friend, in the presence of the physician in charge" ("Principles of Medical Ethics," Sec. 7, Art. III, Chap II). This statement of opinion can and should be made without controversy.

3. "When a physician has attended a case as a consultant, he should not become the attendant during that illness except with the consent of the physician who was in charge at the time of the consultation" ("Principles of Medical Ethics," Sec. 8, Art. III, Chap. II). It is the office of the patient, or his next friend, to obtain the necessary consent of the physician who was in charge at the time of the consultation.

RECURRENCE OF GALL-STONE AFTER OPERATION

To the Editor: Are there any authentic cases of recurrence of gall-stones following a thorough operation for their removal? If so, kindly give references.

E. C. R.

Answer.—The question of recurrence of gall-stones after their removal by surgical operations is one which operators have found difficult to decide, because it is impossible in the majority of cases to be absolutely certain that stones found in the second operation were not overlooked in the former one. It is probably quite common for stones to be missed in an operation, which subsequently give rise to trouble.

For instance: Kehr states that in nineteen out of 491 gall-stone operations, or 4 per cent. of the cases, he overlooked or left in one or more stones. Shott states that in 260 gall-stone operations stones were overlooked twenty-eight times, or 10 per cent. of the cases. These twenty-eight cases appeared to be examples of recurrence, but Shott on analysis (*Beitr. z. klin. Chir.*, xxxix) thinks that in probably all of them the stone or stones which were found at a subsequent operation or at the necropsy were present at the first operation and overlooked. Kehr, however, reports that at a secondary operation he found a stone in the center of which was a small piece of catgut which had been used for sewing the gall-tracts at the first operation. This would certainly exclude the possibility of this stone having been overlooked.

Gall-stones, as a rule, undoubtedly have their origin in the gall-bladder. If the gall-stones were removed and the gall-bladder restored to a reasonably normal condition, it is perfectly conceivable that the conditions which gave rise to the stones in the first instance might readily produce stones a second time, should the conditions recur. As a matter of fact, the conditions leading to the formation of gall-stones seem to occur at a particular time, and experience shows that these conditions very seldom recur. Hence it is exceedingly rare for a recurrence in the sense of the actual formation of new stones *de novo*, after their removal by surgical operation.

AUTOGENOUS VACCINES IN PYORRHEA ALVEOLARIS

To the Editor:—Please give me an opinion as to the merits of autogenous vaccines in the treatment of pyorrhea alveolaris.

L. C. Greenburg, Indianapolis.

Answer.—The treatment of pyorrhea alveolaris with vaccines has been taken up only recently, and as yet a sufficient number of cases has not been reported to justify any conclusion. Indeed, the bacteriology has not been sufficiently studied so that autogenous vaccines of any definite organism have been used in more than a few cases. In general, reports on this subject have included only from three to ten cases in all, with results usually favorable. The organisms most commonly used have been the various streptococci, staphylococci and the pneumococci. In view of these facts, no exact statement can be given at this time. The following references concern some of the better reports:

Eyre, J. W., and Payne, J. Lewis: Some Observations on the Bacteriology of Pyorrhea Alveolaris and the Treatment of the Disease by Bacterial Vaccines, *Proc. Roy. Soc. Med.*, Odont. Sec., Nov. 22, 1909.

Jones, D. W., Carmalt, and Humphreys, J. E.: A Note on the Treatment of Pyorrhea Alveolaris by Inoculation with a Bacterial Vaccine, *Lancet*, London, Dec. 28, 1907, p. 1818.

Williams, William R.: The Vaccine Treatment of Pyorrhea Alveolaris, *Am. Jour. Med. Sc.*, 1911, cxli, 649.

Medalia, L. S.: Chronic Alveolar Osteomyelitis (Pyorrhea Alveolaris), Its Cause and Treatment with Vaccine, *Dental Cosmos*, January and February, 1913.

THE "FOGGING SYSTEM" IN REFRACTION WORK

To the Editor:—Please explain the "fogging system" in examining the eyes.

L. L. E., Iowa.

Answer.—The fogging system means the overcorrection of hyperopia in cases of persistent spasm of the ciliary muscle in which the end sought is a certain degree of functional activity rather than complete immobility. The method simulates the static or cycloplegic method as the ciliary muscle is partially placed at rest by having in front of the eye examined a plus sphere of sufficient strength to more than overcome any ciliary muscle power that the eye might otherwise use when looking at a distance of 20 feet. It is called the fogging method because distant vision is made obscure or foggy by the overcorrecting lens, which renders the eye to all intents and purposes myopic while the lens is being used. This point should be kept in mind in estimating the refractive error, and one should proceed as in any regular case of refraction for myopia. It is only occasionally of service in eyes that have some form of hyperopia or simple myopic astigmatism, but it is not of service in myopia or compound myopia. It might be used in the young subject who must be refracted without drops on account of some local or constitutional disease, but it is not to be relied on as is refraction under a cycloplegic with the added assistance of the skiascope. It is not advisable to use this method without knowledge of the ophthalmoscopic findings, as it often leads to gross errors or even to injury to the eyes.

PHYSICAL CONSTANTS OF OIL OF HORSE CHESTNUT—DETERMINATION OF EPINEPHRIN

To the Editor:—1. Please give the physical constants of oil of horse chestnut (*Aesculus hippocastanum* L.). 2. Also a method for the quantitative estimation of epinephrin chlorid.

Morris T. Myers, Norman, Okla.

Answer.—1. Stillesen (*Proc. Am. Pharm. Assn.*, 1909, lvii, 201) has examined the fixed oil of horse chestnuts, which he obtained from the dried fruits in a yield of from 1.5 to 3 per cent. The oil contains traces of a mustard-like volatile oil which, however, could not be isolated. The specific gravity at 15 C. was 0.9260; refraction index at 20 C., 1.4747; saponification number, 194.5; iodin number, 95.4; Reichert-Meissl number, 1.54; Hehner number, 92.9; acetyl number, 13.5. The oil is mainly composed of olein, containing besides small quantities of linolein, palmitin and stearin. Sulphur was not present. It is intermediate between the half-drying and non-drying oils.

2. A biologic method for the valuation of epinephrin preparations has been elaborated by the Council on Pharmacy and Chemistry and appeared in The Journal, Sept. 30, 1911, p. 1149. Chemical (colorimetric) methods for the determination of epinephrin have recently been published by Otto Folin and his coworkers (*Jour. Biol. Chem.*, 1913, xiii, 477), and by Atherton Seidel (*Ibid.*, 1913, xv, 197).

USE OF DIPHTHERIA ANTITOXIN AS AN IMMUNIZING AGENT

To the Editor:—Please tell me whether or not diphtheria antitoxin has been discontinued as an immunizing agent, and if there is any literature to the effect that if given as an immunizing agent and the patient should subsequently develop diphtheria, it would be hazardous to administer antitoxin.

T. F. H., M.D., Anniston, Ala.

Answer.—A partial answer to this question was given in The Journal, Jan. 11, 1913, p. 147. Diphtheria antitoxin is quite generally used as an immunizing agent. Usually a dose of 500 units is given to all the children in a family in which a case of diphtheria has developed. In such instances no attention is paid to the possibility of anaphylaxis on later injection of diphtheria antitoxin. Indiscriminate immunization by the injection of serum is not advised by any of the writers on this subject. To avoid serious results from anaphylaxis in cases in which known immunizing doses have previously been given, it is customary to inject first a small dose of from 5 to 8 minims, and if no symptoms develop, to follow this within an hour with the full dose which it is desired to inject.

TREATMENT OF XEROSTOMA

To the Editor:—I have a patient whose mouth and pharynx are perfectly dry at all times. The mucosa of the lips, cheeks, soft and hard palate, fauces, pharynx and larynx is perfectly dry and glazed and there does not seem to be any secretion of mucus. This condition has existed for four years. What could cause such a condition? She has some heart-muscle weakness, but kidneys and rest of body are all right. There is a faint yellow tinge to the conjunctiva. Please let me know what you think could cause such a dry condition of the mucosa.

C. T. Pankhurst, M.D., North Star, Mich.

Answer.—Xerostoma or dryness of the mouth is attributed to an affection of the nerve supply of the glands of the mouth. It usually occurs in females and it may be due to febrile conditions, mouth breathing, diabetes, etc. The systemic condition should be carefully determined and appropriate remedies given. Small doses of potassium iodid and pilocarpin (0.003 gm. or 1/20 grain) allowed to dissolve in the mouth with a little water are useful. Galvanism is recommended in cases of centric origin.

THE CONSUMPTION OF SUGAR

To the Editor:—Will you kindly inform me whether 82 pounds per capita (as in "Sugar as Food," editorial, The Journal, Aug. 16, 1913, p. 492) is correct?

H. E. Mereness, M.D., Albany, N. Y.

Answer.—According to Senate Document 890, Sixty-Second Congress, the annual per capita consumption of sugar in the United States is given as 79.2 pounds. Of this amount 53.7 pounds, or 268.5 pounds per family, is purchased by consumers for direct consumption as determined by the U. S. Bureau of Labor of 1901. The remaining 25.5 pounds is purchased by manufacturers for use in confectionery, condensed milk, biscuits, chewing-gum, and other manufactured products.

EFFECTS OF CALCIUM LACTATE

To the Editor:—Please tell me if there would be any untoward effects from the use of calcium lactate given in doses of from 45 to 60 grains a day continued over a very long period of time.

A. C. England, M.D., Pittsfield, Mass.

Answer.—Probably not. It is somewhat doubtful whether calcium salts are absorbed to any large extent from the gastro-intestinal tract.

VIOLET RAYS AND STERILITY

To the Editor:—Can you inform me whether or not there is any truth in the statement that violet rays and high-frequency applications cause sterility, the same as Roentgen rays?

C. L. H. Schwartz, New York, N. Y.

Answer.—We find no references to such an action in recent current medical literature, and the text-books on medical electricity give no evidence of such a fact.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ARIZONA: Phoenix, October 7-8. Sec., Dr. John Wix Thomas, Phoenix.

COLORADO: State Capitol, Denver, October 7. Sec., Dr. David A. Strickler, 612 Empire Building.

GEORGIA: Regular, State Capitol, Atlanta, October 14. Sec. Dr. C. T. Nolan, Marietta; Homeopathic, Atlanta, October 1. Sec., Dr. R. E. Hinman, 106½ Whitehall St.; Eclectic, State Capitol, Atlanta, October 14. Sec., Dr. C. W. Miller, 192 W. North Ave.

IDAHO: Boise, October 7. Sec., Dr. John F. Schmershall, Jerome.

ILLINOIS: Coliseum Annex, Chicago, September 24-26. Acting Sec., Amos Sawyer, Springfield.

KANSAS: National Hotel, Topeka, October 14. Sec., Dr. H. A. Dykes, Lebanon.

LOUISIANA: New Orleans, October 27-29. Sec., Dr. A. B. Brown, 34 Cusachs Building.

MICHIGAN: Capitol Bldg., Lansing, October 14-16. Sec., Dr. B. D. Harison, 504 Washington Arcade, Detroit.

MINNESOTA: University of Minnesota, Minneapolis, October 7-10. Sec., Dr. Thomas S. McDavitt, 814 Lowry Building, St. Paul.

MISSISSIPPI: Jackson, October 28-29. Sec., Dr. E. H. Galloway, Jackson.

MONTANA: State Capitol, Helena, October 7. Sec., Dr. Wm. C. Riddell, Helena.

NEW JERSEY: State House, Trenton, October 21-22. Sec., Dr. H. G. Norton, 429 E. State Street.

NEW MEXICO: Santa Fe, October 13. Sec., Dr. W. E. Kaser, East Las Vegas.

NEW YORK: September 23-26. Chief of Examinations Division, Mr. Harlan H. Horner, Department of Education, Albany.

OKLAHOMA: Muskogee, October 14. Sec., Dr. John W. Duke, Guthrie.

RHODE ISLAND: State House, Providence, October 2-3. Sec., Dr. Gardner T. Swarts.

UTAH: Salt Lake City, October 6-7. Sec., Dr. G. F. Harding, 310 Templeton Building.

WYOMING: State House, Cheyenne, October 15. Sec., Dr. J. B. Tyrrell, Laramie.

New Jersey Reciprocity Report

Dr. H. G. Norton, secretary of the New Jersey State Board of Medical Examiners, reports that sixty-one candidates were licensed through reciprocity since Jan. 1, 1913. The following colleges were represented:

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
University of Colorado	(1907)	Utah
College of Physicians and Surgeons, Chicago (1904)	(1907)	Illinois
University of Iowa, College of Medicine	(1892)	New York
Baltimore Univ... (1903) Pennsylvania (1898)	(1900)	New York
Boston University	(1905)	Maine
New York Univ. Med. Coll. (1898) New York;	(1898)	Penna.
Eclectic Med. Coll., New York...(1899) (1900)	(1906)	New York
New York Homeo. Med. Coll. and Hosp	(1911)	New York
Albany Medical College	(1903)	New York
Syracuse University	(1912)	New York
Cornell University (1903) (1905)	(1911)	New York
University and Bellevue Hospital Medical College, New York (1908) (1911) New York.		
Columbia University, College of Phys. and Surgs. (1898) (1904) 1907, 2) (1910, 2) (1911) (1912, 2) New York.		
Long Island College Hospital, New York (1900) (1908) (1909) New York; (1912) District of Columbia.		
University of Pennsylvania (1898) (1899, 2) (1911) (1912) Pennsylvania.		
Jefferson Medical College (1910) Maine; (1898) (1900) (1910) (1912) Pennsylvania.		
Hahnemann Medical College and Hospital, Philadelphia (1894) (1897) (1902) (1910) Pennsylvania.		
Women's Medical College of Pennsylvania (1901) New York; (1912) Pennsylvania.		
Medico-Chirurgical College of Philadelphia (1906, 2) (1909) (1912) Pennsylvania.		
University of Pittsburgh	(1909)	Penna.
University of *Vermont*	(1912)	Vermont
University of Naples, Italy (1895, 2)	(1896)	New York
University of Palermo, Italy	(1887)	New York

Kansas February Report

Dr. H. A. Dykes, secretary of the Kansas Board of Medical Registration and Examination, reports the written examination held at Topeka, Feb. 11-13, 1913. The number of subjects examined in was 10; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 4, of whom 3 passed and 1 failed. Fifteen candidates were licensed through reciprocity. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Howard University, Washington, D. C.	(1912)	82.
University of Kansas	(1912)	81
Kansas City Medical College	(1903)	76.
FAILED		
Meharry Medical College	(1911)	66

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Northwestern University Medical School	(1905)	Iowa
Hering Medical College	(1902)	Colorado
Eclectic Medical College of Indiana	(1904)	Texas
Medical College of Indiana	(1894)	Indiana
Iowa College of Physicians and Surgeons, Des Moines,	(1896)	Iowa
University of Louisville	(1912)	Kentucky
St. Louis University	(1909)	Missouri
Washington University, St. Louis	(1910)	Missouri
University Medical College, Kansas City	(1898)	Missouri
Eclectic Medical College, Cincinnati	(1911)	Missouri
University of Tennessee (1906)	(1912)	Tennessee
College of Physicians and Surgeons, Memphis	(1911)	Tennessee
Tennessee Medical College	(1894)	Tennessee
Meharry Medical College	(1912)	Tennessee

Massachusetts May Report

Dr. W. P. Bowers, secretary of the Massachusetts Board of Registration in Medicine, reports the written and practical examination held at Boston, May 13-15. The number of subjects examined in was 13; total number of questions asked, 70; percentage required to pass, 75. The total number of candidates examined was 41, including 12 non-graduates and 5 osteopaths, of whom 21 passed, including 4 non-graduates and 1 osteopath, and 20 failed, including 9 non-graduates and 4 osteopaths. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Bennett Medical College	(1913)	80
Chicago College of Medicine and Surgery	(1912)	75
Medical School of Maine	(1899)	81
Baltimore Medical College	(1912)	79.9
Tufts College Medical School..(1911) 79.7, 80.2;	(1912)	75
College of Physicians and Surgeons, Boston	(1910)	75
Boston University	(1897)	80
Harvard Medical School, (1887) 80; (1910) 77.8;	(1911)	81.6
Dartmou	(1906)	75
Albany	(1911)	75
Universi	(1899)	79
Universi	(1912)	76.1
Non-Graduates, 75, 75, 76, 76.5.		
FAILED		
Atlanta School of Medicine	(1912)	65.6
Chicago College of Medicine and Surgery	(1912)	68.5
Maryland Medical College	(1912)	55.3
Harvard Medical School	(1913)	69.2
University of Vermont (1891) 65;	(1912)	70.5
Royal University of Palermo, Italy	(1908)*	
Non-graduates, 47, 55, 63.6, 65.5, 68, 68.7, 70.5, 71, 71.4.		

* *Examination not completed.*

Mississippi June Report

Dr. E. H. Galloway, secretary of the Mississippi State Board of Health, reports the written examination held at Jackson, June 3-4, 1913. The number of subjects examined in was 8; total number of questions asked, 64; percentage required to pass, 75. The total number of candidates examined was 54, of whom 41 passed, 12 failed and one withdrew. One candidate was licensed through reciprocity. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
University of Alabama...(1885) 75, (1909) 86,	(1912)	78.7
Atlanta School of Medicine	(1913)	76.5, 77, 77.
Atlanta College of Physicians and Surgeons	(1913)	75
Chicago College of Medicine and Surg. (1912) 78;	(1913)	84
University of Louisville	(1913)	79
Tulane University of Louisiana, (1912) 88; (1913) 81, 81, 82, 84, 91.		
St. Louis College of Physicians and Surgeons	(1912)*	80
Vanderbilt University, Nashville (1911) 88; (1913) 75.5, 81, 83, 84.1, 92.3.		
Memphis Hospital Medical College (1912) 79; (1913) 75, 75.7, 76, 78, 78.5, 79, 79, 79, 79, 80, 80.1, 82, 87.		
University of Tennessee (1913) 83, 83, 84.		
University of Virginia	(1913)	80
FAILED		
Birmingham Medical College	(1908)	65
Reliance Medical College	(1911)	65

Memphis Hospital Medical College (1910) 65.5; (1911) 63.3; (1912) 47; (1913) 63, 66, 69.		
University of Tennessee	(1912)	67, 71
Meharry Medical College	(1907) 60; (1911)	61

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Memphis Hospital Medical College	(1911)	Tennessee

* College reports no record of graduation.

Wyoming June Report

Dr. J. B. Tyrrell, secretary of the Wyoming State Board of Medical Examiners, reports the written examination held at Cheyenne, June 25-27, 1913. The number of subjects examined in was 10; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 5, of whom 4 passed and 1 failed. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
College of Physicians and Surgeons, Chicago	(1912)	90.
Chicago College of Medicine and Surgery	(1913)	87.7
Baltimore Medical College	(1912)	90.7
University of the South	(1908)	91.4

FAILED

College	Year Grad.	Per Cent.
Ensworth Medical College	(1908)	70.

Montana July Report

Dr. William C. Riddell, secretary of the State Board of Examiners of Montana, reports the written examination, held at Helena, July 8-10, 1913. The number of subjects examined in was 10; total number of questions asked 50; percentage required to pass 75. The total number of candidates examined was 20, of whom 14 passed and 6 failed. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
University of Colorado	(1904)	80.9
Rush Medical College	(1902) 77.9; (1910)	75.3
Northwestern University Medical School	(1896) 77.4; (1910)	86.
Chicago College of Medicine and Surgery	(1913)	79.8
College of Physicians and Surgeons, Chicago	(1913)	84
College of Physicians and Surgeons, Keokuk	(1898)	82
Harvard Medical School	(1913)	79.9
University of Michigan, College of Homeo. Med.	(1898)	80.6
University Medical College, Kansas City	(1913)	79.3
Creighton Medical College	(1909) 75.3; (1913)	78.9
Jefferson Medical College	(1910)	80.5

FAILED

College	Year Grad.	Per Cent.
Bennett Medical College	(1911)	73.4
College of Physicians and Surgeons, Chicago	(1910)	70.3
Physio-Medical College of Indiana	(1888)	29
St. Louis University	(1913)	73.9
Wisconsin College of Physicians and Surgeons	(1905)	57.8
Marquette University, Milwaukee	(1911)	70.3

Rhode Island July Report

Dr. Gardner T. Swarts, secretary of the Rhode Island State Board of Health, reports the written examination held at Providence, July 10-11, 1913. The number of subjects examined in was 7; total number of questions asked, 70; percentage required to pass, 80. The total number of candidates examined was 10, of whom 7 passed and 3 failed. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
Howard University, D. C.	(1913)	80
Tufts College Medical School (1911) 87.5; (1912) 80;	(1913)	88.3
Harvard Medical School, Boston	(1913)	82.2
Columbia University, College of Physicians and Surgeons, New York	(1912)	81
University of Pennsylvania	(1913)	90.5

FAILED

College	Year Grad.	Per Cent.
Tufts College Medical School	(1913)	78
New York Homeopathic Medical College	(1910)	77.5
Laval University, Canada	(1912)	65.2

North Dakota July Report

Dr. G. M. Williamson, secretary of the North Dakota State Board of Medical Examiners, reports the written, oral and practical examination held at Grand Forks, July 1-4, 1913. The number of subjects examined in was 13; total number of questions asked, 116; percentage required to pass, 75. The total number of candidates examined was 15 of whom 7 passed and 8 failed. Five candidates were licensed through reciprocity. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
Chicago Homeopathic Medical College	(1895)	75.1
Rush Medical College	(1912)	78.7
College of Phy[illegible] Chicago	(1911) 75.;	77.4
Northwestern [illegible] School	(1913)	87.3
Minneapolis College of [illegible] and Surgeons	(1892)	75.
University of Manitoba	(1909)	81.6

FAILED

College	Year Grad.	Per Cent.
Chicago College of Medicine and Surgery	(1910)	67.6
Northwestern University Medical School	(1911)	69.1
College of Physicians and Surgeons, Chicago	(1900)	58.
Medical College of Indiana	(1902)	62.7
Keokuk Medical College, College of Physicians and Surgeons	(1903)	70.4
Marquette University	(1910) 69.8; (1912)	66.1
Queen's University, Kingston, Ontario	(1911)	67.9

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Rush Medical College	(1906)	Illinois
Northwestern University Medical School	(1906)	Illinois
College of Physicians and Surgeons, Chicago	(1910)	S. Dakota
University of Minnesota, Homeopathic College	(1904)	Minnesota
Trinity Medical College	(1903)	S. Dakota

Washington July Report

Dr. F. P. Witter, secretary of the Washington State Board of Medical Examiners, reports the oral, written and practical examination held at Tacoma, July 8, 1913. The number of subjects examined in was 11; total number of questions asked, 132; percentage required to pass, 75, and not less than 60 in any subject. The total number of candidates examined was 54, including 2 osteopaths, of whom 38 passed, including 1 osteopath, and 16 failed, including 1 osteopath. The following colleges were represented:

PASSED

College	Year Grad.	Total No. Examined
Georgetown University, D. C.	(1912)	1
University of Illinois	(1913) (1912,2)	2
Bennett Medical College	(1911)	1
Rush Medical College	(1913)	1
Chicago College of Medicine and Surgery	(1910)	1
Northwestern University Medical School	(1909) (1913)	2
University of Iowa	(1908)	1
University of Louisville	(1907)	1
Johns Hopkins University	(1913)	1
Baltimore Medical College	(1909)	1
Tufts College Medical School	(1909)	1
University of Michigan, Dept. of Med. & Surg.	(1913)	1
University of Minnesota	(1907) (1912)	2
Hamline University	(1905)	1
University and Bellevue Hospital Med. College	(1912)	1
University of Buffalo	(1909)	1
Columbia Univ., College of Phys. & Surgs.	(1896) (1907)	2
University of Oregon	(1905) (1911) (1912) (1913,3)	6
Jefferson Med. College	(1908) (1911) (1912,3) (1913,2)	7
University of Virginia	(1888)	1
University of Toronto	(1902)	1

FAILED

College	Year Grad.	Total No. Examined
Rush Medical College	(1882)	1
University of Indiana	(1907)	1
University of Iowa	(1908)	1
College of Phys. & Surgs., Kansas City, Kan.	(1898)	1
Kentucky School of Medicine	(1906)	1
College of Phys. & Surgs., Baltimore	(1905)	1
University of Michigan, Dept. of Med. & Surg.	(1890)	1
University Medical College, Kansas City	(1900)	1
Barnes Medical College	(1907)	1
Syracuse University	(1900)	1
Eclectic Medical College, Cincinnati	(1911)	1
Willamette University	(1913)	1
University of Pittsburgh	(1911)	1
University of Nashville	(1902)	1
Siena University, Italy	(1909)	1

Patent Medicine Domination.—The way out of the "patent-medicine" domination lies in the better training of physicians on the one hand and the enlightenment of public opinion on the other. No more effective agency exists for the forming of public opinion than an aggressive administration of the bureau at Washington which deals with pure food and pure drugs. No single agency in this direction has counted for so much as the personal work of one man, who has spent his life in fighting frauds and poisons. But we must have a hundred Wileys in the public service where now we have not one.—David Starr Jordan, *Science.*

Book Notices

The American Encyclopedia and Dictionary of Ophthalmology. Edited by Casey A. Wood, M.D., C.M., D.C.L. Volume I: A to Azoviolett. Cloth. Price, $6. Pp. 727, with illustrations. Chicago: Cleveland Press, 1913.

Of making books there is no end; but, till this ambitious volume, there had never been even a beginning of any attempt at a comprehensive, truly exhaustive exposition of ophthalmology in English. Text-books indeed have appeared in English from time to time, some of much, and more of little, worth. Quiz-compends have been known to exist. Numerous periodicals have been published—annals, journals, archives, records, etc.—and these, in general, have held their own with similar publications in German, Italian and French. Then, finally, appeared the Norris and Oliver "System of Diseases of the Eye," in four quarto volumes, extremely useful even now. But even that systematic treatise exhibited lacunae. It told us, for example, much of ophthalmology, but nothing at all of ophthalmologists. It showed, in a highly commendable manner, the ophthalmic practice of the day in which it appeared, but nothing whatever of the earlier stages of this slowly developing art—it exhibited, in other words, all the modern flower and fruitage, but absolutely nothing of the rough medieval trunk, or of the strong *ancient* roots, which, for sustenance, dipped far down into a humus of philosophy and religion. Then, too, in matters of refraction and accommodation, in ocular innervation and motility, as well as in a thousand lesser matters, like the accommodometer, the angulometer, the Aleppo button, and ophthalmologic chemistry and botany, the "System" of Norris and Oliver was most decidedly defective.

The French have done better. They have their "Encyclopédie française d'ophthalmologie"—nine goodly volumes that cover the major portion of the subject of ophthalmology, though omitting a number of extremely important matters.

The Germans have done better still. They produced, as a kind of beginning, the first edition of the Graefe-Saemisch "Handbuch der gesammten Augenheilkunde"—not so much a handbook, by the way, as a heavy, double armload of very extensive treatises. Then, patiently, and after the fashion of the great Teutonic investigators and writers—a fashion which will sooner or later be followed in this land of too many short-cuts—the Graefe-Saemisch editors and contributors set to work on a *monumental* "Zweite Auflage"—an enormous production which is still in the course of publication. Unfortunately, however, so extensive and so unrelated are the numerous parts of the "Zweite Auflage" that the reader has great difficulty in finding anything in it, and will continue to have until the work is complete and furnished with an index.

There was also a German Encyclopedia of Ophthalmology—excellent, too, but ill-starred. It went to about the letter M, since which nothing has appeared.

This is the first volume of an American attempt of similar character—an attempt which, we believe, is also the first of its kind in the English language.

The work is planned to appear in *ten octavo* volumes, each of seven or eight, or possibly *nine*, hundred pages, and then, at the close, an appendical volume, in which will be comprised, chiefly, such discoveries of importance in the field of ophthalmology as happen to have been made too late to be included in any of the earlier volumes.

The volume now before us—a well-bound, well-printed, beautifully illustrated production—is devoted entirely to subjects that begin with the letter A, and the comprehensive character of the work as a whole is well shown by the opening article of this the opening volume—"A": "Just as in modern times one often uses the initial letter of the name of a patient whose identity one desires to conceal, so the ancients occasionally employed the same device." The article thus begins and then goes on to relate the anamnesis and case report of an ophthalmic patient dead more than twenty hundred years. But the case is illustrative of ancient ophthalmic temple-practice, and so it is admitted to the book. The final article in the volume is entitled "Azoviolett," the name of a certain tint used now and then in spectacle lenses.

Between these two articles lie hundreds of others, varying, of course, in value, but, for the most part, scholarly, and so clearly, often so picturesquely, written as to be of the utmost interest alike to specialists and general practitioners. Among the contributors to the volume are Jackson, Allport, Frank, Würdemann, Ball, Beard, Rochester, Zentmayer, Gradle, Shastid, Posey, McKee and, indeed, nearly all the other men who have made American ophthalmology what it is. None but American (including, of course, Canadian) ophthalmologists contribute to the volume or to the series.

Aside from his work as one of the contributors, Dr. Wood is to be cordially congratulated—still more, the world of ophthalmology—on the masterly editing exhibited throughout the volume. The fine coordination of article with article, in works of an encyclopedic character, is never the result of happy accident.

Whether or not the standard erected by Volume I of this Encyclopedia is to be attained by succeeding volumes, the *initial effort* of the series will indubitably stand as a credit to American scholarship and American literary style. There should be more works of a similar character devoted to other specialties.

A Reference Handbook of the Medical Sciences, Embracing the Entire Range of Scientific and Practical Medicine and Allied Sciences. By Various Writers. Third Edition. Edited by Thomas Lathrop Stedman, A.M., M.D. Complete in 8 Volumes. Cloth. Price, $56 set. Volume I—Aachen to Bacteriuria. Pp. 928, with 611 illustrations. New York: William Wood & Co., 1913.

This work, which has been favorably received by two generations of medical men and is now before us in its third edition, is essentially a new one. The first two editions were edited by Dr. Albert H. Buck, but the third appears under the supervision of Dr. T. L. Stedman. It is not necessary to compare the previous editions with the present one, as it is evident that such a comparison could only illustrate the well-known fact of the tremendous advance of medicine in the past decade. Not only have the articles dealing with subjects treated in the second edition been thoroughly revised, but more or less extended treatises on new subjects have been added. Some characteristics of the work shown by a perusal of the first volume are worthy of notice. The first feature is the variety of the material and the number of authors who have been secured to present it. The list of contributors includes over a hundred names of specialists, most of whom are well-known American authors. The variety of subjects is still more striking; the larger topics are presented under convenient alphabetical subdivisions so that the anatomy of the abdomen forms a special topic in its alphabetic order. In addition a system of cross-references enables one to find the description of minor topics. Under these cross-references are included in many cases a sufficient account so that the larger title need not be referred to. The scope of the work includes medical history and biography, so that one may seek information here that he will fail to find in other systematic works. The extension of the work in the direction of the fundamental sciences, such as chemistry, biology, anthropology, etc., affords a welcome fund of information to one who has not the most extensive general encyclopedias at hand. Especially the information in reference to climatology and the conditions at various resorts and health stations would be difficult to duplicate. The thorough treatment of the individual topics can be appreciated only by careful reading. The subject of bacteria and bacteriologic technic is given over a hundred pages of this large volume, easily equivalent to three hundred of the ordinary text.

Another feature that adds materially to the value of the work is the excellent illustrations. Many are in colors, and especially those of skin diseases and of pathologic changes depict very strikingly and faithfully the objects described.

A review of the subjects included in the first volume is impossible in the space at command. The first important topic is the surgical anatomy of the abdomen, and this is supplemented by the surgical anatomy of the abdominal organs and a consideration of the diagnosis of abdominal tumors. These articles furnish a thorough account of a very important subject. We note that the illustration of the position of the organs pictures the stomach as lying transversely across the abdomen, following the anatomic text-books of a past decade. Another unimportant but very noticeable adherence to an older view is the statement that the colon is to be inflated by passing a tube into the descending colon, an unnecessary and probably impossible performance. On the whole, the treatment of these subjects seems very satisfactory. We shall await the appearance of the subsequent volumes of the series with great interest. If, as is to be assumed, they bear out the promise given by the initial volume, we can predict that these volumes will be as indispensable to the next generation of medical men as their predecessors have been to the present.

Text-Book of General Pathology. By Various Authors. Edited by M. S. Pembrey and J. Ritchie. Cloth. Price, $5 net. Pp. 773, with 40 illustrations. New York: Longmans, Green & Co., 1913.

The subject of this work is not morbid anatomy but morbid physiology, whose "province is to correlate the processes in the diseased with those in the healthy; to determine the causes of failure in the interdependence of the different parts of the body; to show how the failure of one tissue reacts on all other tissues, and by following the progress of disease to explain how it causes death."

The book is the work of a number of specialists, including physiologists, pathologists and clinicians. The editors expressly state that no attempt has been made to reconcile divergencies of opinion which may appear in the different sections. The work is intended for advanced students and general practitioners. It is devoted to the consideration of a class of topics which must appeal to both classes from their intrinsic interest as well as their practical importance.

General Surgery. Edited by John B. Murphy, A.M., M.D., L.L.D. (Practical Medicine Series, Vol. II.) Cloth. Price, $2. Pp. 632, with 252 illustrations. Chicago: The Year Book Publishers, 1913.

The subjects taken up particularly in this volume are anesthesia, operative technic, wound-healing and pathologic interventions, malignant tumors, surgery of bones, joints, tendons, blood-vessels, skull and brain, face and mouth, thyroid, thymus, thorax, abdomen, appendicitis and fractures. The book is well illustrated, and of special value to the reader, aside from the good selection of the material, are the comments of the editor. His wide experience and unusual acuity of clinical observation naturally have led him to formulate opinions which cannot fail to be of value to every practitioner. The book contains a great deal of practical, useful material such as the general surgeon needs to refer to daily.

Blood-Pressure in General Practice. By Percival Nicholson, M.D. Cloth. Price, $1.50. Pp. 157, with 7 illustrations. Philadelphia: J. B. Lippincott Company, 1913.

This is a handy little manual giving the principles of the taking of the blood-pressure, describing the instruments, of which the author naturally favors his own and points out the disadvantages of the aneroid instruments, and indicating the significance of the findings as showing pathologic conditions. The superiority of the auscultatory method of determining the reading of the diastolic pressure is emphasized. A brief account of the treatment of high and low blood-pressure is added. The book ought to be very useful to those who wish to inform themselves on the subject, a knowledge of which has become indispensable to the practicing physician.

Müller's Serodiagnostic Methods. Authorized Translation from the Third German Edition. By Ross C. Whitman, B.A., M.D., Professor of Pathology, University of Colorado School of Medicine. Cloth. Price, $1.50 net. Pp. 146, with 7 illustrations. Philadelphia: J. B. Lippincott Company, 1913.

Seriodiagnosis and immunity reactions have become so numerous and so complicated and are so extensively applied that the desirability of a reliable guide to the technic of the various procedures must be felt by laboratory workers as well as by students and practitioners in general. The present work is a translation from the third edition of the German original. The descriptions of the various methods are clear and the translation is excellent. One is surprised at the omission of Noguchi's modification of the Wassermann reaction, but we are informed in the translator's preface that this omission is at the request of its author. Some other methods have been added by the translator, but with these exceptions the translation follows closely the German original.

Medicolegal

Interdicted Information and Use of Decoy Letters

(Ackley vs. United States (U. S.), 200 Fed. R. 217)

The United States Circuit Court of Appeals, Eighth Circuit, affirms a conviction of the appellant Ackley of sending a letter through the mail furnishing information where and from whom articles could be obtained which would prevent conception. The articles he tried to sell were a "lady's syringe" and "sanitary powder." The court says that the statute is: "Every article or thing adapted . . . described in manner calculated to lead another to use it for preventing conception" is unlawful. The article may be of legitimate use; in fact it may not prevent conception, but if it is calculated to lead another to use it for such purpose it is unlawful. And that was what the appellant meant when he wrote his letter and when he sent it with the circular through the mail. It is the deposit for mailing that constitutes the offense and when that is done the offense is complete.

Complaint was made of the fact that the letters of the post office inspector to the appellant were answered under the assumed name of a woman, but for which the appellant's letters and pamphlet would not have been mailed. A party who persuades another to commit a crime is an accessory, and as a witness is to be considered as such, and his testimony weighed accordingly. But when officers, or even a private citizen desirous of enforcing the laws, believes from general information, and as in this case, from the pamphlet reciting "Woman's Doctor," "Woman's Friend," "Woman's Syringes," "Woman's Antiseptic Germ-Killing Powders," "Consultations only at my offices," "Syringes sent by freight only," then the officer had the legal, as he had the moral, right to send "decoy letters." It is now too late to complain of decoy letters in such a case.

Liability for Malpractice where Two Independent Physicians Are Employed

(Morey vs. Thybo (U. S.), 199 Fed. R. 760)

The United States Circuit Court of Appeals, Seventh Circuit, reverses a judgment for malpractice rendered against the defendant Morey for error in submitting to the jury a count in the declaration in which Mrs. Thybo alleged that he, "together with one Rice, another physician and surgeon whom the defendant then and there called in to assist him and for consultation," negligently tore and lacerated her vagina and uterus in delivering her of a child, failed to remove all of the afterbirth, and used unsterilized instruments, in consequence of which blood-poisoning developed.

The court says that the undisputed facts were that Morey alone was first employed; that he had no business relation, or even acquaintance, with Rice; that Mrs. Thybo and Rice were old-time friends; that Mr. Thybo, the husband, telephoned to Rice to come to the Thybo home; that after Rice's arrival at 10 p. m. he concluded from his examination that delivery was impossible without the use of instruments; that, by agreement of Rice and Morey, Rice was to use the instruments and Morey to administer the anesthetic; that this division of service was known to Mrs. Thybo and her husband, and not objected to; that deliveries of the child and of the placenta, Morey and Rice each doing his part, were effected during the early hours; that Morey left at 2 a. m., and Rice returned home at 4 a. m.; and that the subsequent treatment was by Morey.

Whether the forceps were sterilized or not was a matter of sharp dispute; but, of course, the jury's finding that they were not must be accepted. Rice brought his own instruments. After his examination and decision to use forceps, Morey went into the bedroom and got ready to administer the anesthetic. Mrs. Thybo was lying crosswise on the bed. Morey was at her head. After Morey was in that position, he did not see Rice until he came into the bedroom attired in surgeon's garb and with the instruments in his hands. There was no testimony that Morey saw the instruments before Rice brought them into the bedroom. Consequently no basis was afforded by the evidence for a finding that Morey knew of and acquiesced in the use of unsterilized forceps. By the exercise of reasonable diligence, under the circumstances, should he have known? Not unless, while attentively engaged in his own part of the service, he ought gratuitously to have entertained a suspicion that an apparently learned and skilful surgeon was about to commit a gross medical offense, and to have followed up the suspicion by inquiring whether his brother had forgotten to sterilize his hands and his instruments. No such unreasonable burden is imposed by the law.

When the afterbirth was delivered, Rice examined it, found it to be entire, and at once had it disposed of. Morey, from across the bed, looked at it, and to him it appeared to be intact. Nothing in the record warranted a finding that Morey knew that Rice had not removed all of the afterbirth. And here, too Morey was not bound to assume, in the absence of observable indications, that Rice was incompetent. Similarly, with respect to lacerations, Morey, from his position, could not know of them for himself; and from Rice's silence he was not negligent in inferring that no lacerations requiring repair operations had been inflicted. If Morey in his subsequent visits negligently failed to discover promptly and to treat properly the lacerations and the blood-poisoning, those were matters of his own direct responsibility.

Two physicians, independently engaged by the patient and serving together by mutual consent, necessarily have the right, in the absence of instructions to the contrary, to make such a division of service as in their honest judgment the circumstances may require. Each must not only bring to the case the ordinary knowledge and skill of the profession, but also give his best personal attention and care. Each, in serving with the other, is rightly held answerable for his own conduct, and as well for all the wrongful acts or omissions of the other which he observes and lets go on without objection, or which in the exercise of reasonable diligence under the circumstances he should have observed. Beyond this, his liability does not extend.

Communications Made in Presence of Third Parties

(Denaro vs. Prudential Insurance Company of America (N. Y.), 139 N. Y. Supp. 758)

The Second Appellate Division of the Supreme Court of New York says that it was contended that certain communications, to which physicians who had attended the plaintiff were permitted to testify over the objection that they were privileged, were made to the physicians in the presence of the insured's father or others near, and that, under the rule which prevails in reference to attorneys, where communications are made to them in the presence of third parties, it loses the character of a confidential communication, this testimony was not objectionable. The court does not think, however, that the situations are analogous. Where a client visits his attorney with an opposing party, and they all enter into a general discussion, or the attorney is asked to become a witness to the execution of a paper, etc., there is an obvious intent to make the communication public; but when a physician enters a house for the purpose of attending a patient, he is called on to make inquiries, not alone of the sick person, but of those who are about him and who are familiar with the facts, and communications necessary for the proper performance of the duties of a physician are not public because made in the presence of his immediate family or those who are present because of the illness of the person. Of course, the persons who are present are not denied the right to testify. It is only the physician who is bound by the rule; but it is absolute as to him, except in those exceptions provided by the statute. He is forbidden not to reveal communications from his patient, but "any information which he acquired in attending a patient, in a professional capacity, and which was necessary to enable him to act in that capacity;" and it is of no consequence how the information was acquired, whether by some one telling him, or by observation, or in any other manner.

Aggravation of Abnormal Mental or Nervous Condition

(Cook vs. Village of Mohawk (N. Y.), 100 N. E. R. 815)

The Court of Appeals of New York says that the plaintiff charged that the defendant had wrongfully obstructed a natural waterway in such a manner as to discharge the water on the plaintiff's lands, causing damage thereto and affecting the health of the plaintiff's wife, who was one of the occupants. Evidence was admitted which emphasized the element of emotional or mental suffering on the part of the wife when it should have been excluded. The defendant should not be held liable for the mental or nervous disturbance of the plaintiff's wife, due to a cause entirely separate from the flooding of the plaintiff's premises. The wife had a fibroid tumor. If this was responsible for a mental or nervous condition which made her unnecessarily apprehensive of the flooding of the land, and this increased her ailment, the defendant could not be charged with the consequences. Mental suffering is not a legal element of damages in such cases, and there can be no recovery, except for physical ills which can be ascribed directly and with reasonable certainty to the defendant's wrongful act.

Validity of Law Providing for District Hospitals for Treatment of Tuberculosis

(Brissel vs. State (O.), 100 N. E. R. 348)

The Supreme Court of Ohio holds that the act of the legislature of that state, approved March 23, 1909, which provides for establishing and maintaining of district hospitals for the care and treatment of persons suffering from tuberculosis, is a valid exercise of legislative power not repugnant to the constitution. The court says that it may be conceded that the law is not so full in some of its details as might be desired to give facility to its administration, but the court will not let its purpose fail of its beneficent result for this reason alone. In the absence of plain terms to require a different course, such a construction will be put on the statute as will prevent the failure of the manifest purpose of the legislature. The court will not by construction paralyze the arm of the joint board by denying to it the power necessarily incident to the actual and definite grant of authority.

When a board of commissioners has proceeded with the commissioners of other counties to the formation of a joint board referred to, and when that board has been formed and proceeded to the carrying out of the duties imposed on it by the statute, each of the counties whose commissioners have joined in the forming of the board has fixed and definite obligations, with reference to the hospital, which cannot be terminated at the mere will of any such county. The will of the majority must control, so long as it violates no provisions of the law.

Cousin Entitled as a Physician to Recover for Administering Anesthetic

(Epstein vs. Hugel (N. Y.), 138 N. Y. Supp. 1072)

The First Appellate term of the Supreme Court of New York reverses a judgment on a verdict for the defendant and orders a new trial, with costs to the plaintiff to abide the event, in this case where the plaintiff sued for his services, as a physician, rendered to the defendant. The court says that it was uncontradicted that the plaintiff visited the defendant in Connecticut and thereafter the defendant was operated on by a Dr. Goodman, the head of a hospital, and that the plaintiff assisted at the operation. But it was claimed by the defendant that the plaintiff, who was his cousin, when he called on him, first called only in a social way, and the defendant endeavored to meet the plaintiff's claim for compensation by claiming that there was a partnership between Dr. Goodman and the plaintiff, and that having paid Dr. Goodman $500 he should pay nothing whatever to the plaintiff for the services rendered by the plaintiff at the operation. The only evidence adduced by the defendant as to the existence of a partnership between the plaintiff and Dr. Goodman was evidence that the plaintiff and Dr. Goodman occupied the same house. The evidence was uncontradicted that the plaintiff assisted, with several other physicians, at the operation and that he personally administered the anesthetic to the defendant. The court thinks that he, at any rate, was entitled to recover for this service.

Evidence of Specializing as Touching Competency in Other Lines

(Klodek vs. May Creek Logging Co. (Wash.), 129 Pac. R. 99)

The Supreme Court of Washington affirms a judgment in the plaintiff's favor for damages for an alleged breach of contract on the defendant's part in the matter of furnishing him medical attendance when injured while in its employ. The defendant claimed to have been prejudiced by the introduction of a newspaper advertisement containing the name of the attending physician and describing his specialty and place of business: "Eye and Nose. 206-7 Marion Building." But the court is unwilling to hold that this was error. It says that it will take notice of modern tendencies and conditions in the medical profession, and if a physician holds himself a specialist along certain lines it is no discredit to him to show that fact, and from it raise the inference that he is not keeping up with practice in other lines. At any rate, he, or those relying on him, should not complain of the burden of meeting the *prima facie* showing. The basis of the charge in this case was that the physician was incompetent and unskilled. It was for the jury to say whether he was or not and the fact that he was specializing in other branches of the profession was a circumstance relevant to the issues.

Validity of State Quarantine Regulations

(Simpson vs. Shepard (U. S.), 33 Sup. Ct. R. 729)

The Supreme Court of the United States says that quarantine regulations are essential measures of protection which the states are free to adopt when they do not come into conflict with federal action. In view of the need of conforming such measures to local conditions, Congress, from the beginning, has been content to leave the matter for the most part, notwithstanding its vast importance, to the states and has repeatedly acquiesced in the enforcement of state laws. Such laws undoubtedly operate on interstate and foreign commerce. They could not be effective otherwise. They cannot, of course, be made the cover for discriminations and arbitrary enactments, having no reasonable relation to health, but the power of the state to take steps to prevent the introduction or spread of disease, although interstate and foreign commerce are involved (subject to the paramount authority of Congress if it decides to assume control) is beyond question.

Senile Dementia and Testamentary Capacity

(In re Purcell's Estate (Cal.), 128 Pac. R. 932)

The Supreme Court of California says that the will which this suit was brought to revoke was made by Mrs. Purcell when she was 71 years of age in anticipation of and shortly before a severe surgical operation on her. It was clear that, although the physician was of the opinion that, as a matter of medical science, her mind was not physically entirely sound, all he meant by that opinion was that she had a slight impairment of memory due to old age which led her to rely on others more than she otherwise would, but that she was nevertheless able to and always did think, talk and act rationally, and manage such of her affairs as she there had in hand with reasonable prudence and judgment. The witness himself appeared to believe that she should have decided about the operation without consulting her brother-in-law, who had been for years her trusted business manager. The medical profession may describe such a condition as senile dementia and declare such a person mentally unsound, but it does not constitute the sort of incompetency or insanity which, in the estimation of law and of men of ordinary sagacity and prudence, renders a person incapable of executing contracts or making a will. Her conduct and conversation, as detailed by physicians, rather tended to show that she herself was aware of her failing memory of recent events, and that she prudently chose to rely on others in whom she had confidence in her business affairs, and that in all other respects she had at least ordinary wisdom, judgment and mental capacity. If there were times when she was incapable of transacting business, the time when she executed the will was clearly one of her lucid intervals. A careful reading of the whole evidence brings the court to the conviction that on the whole case no reasonable person could believe that she had not sufficient mental capacity to make the will in question.

Admitting Lack of Experience or Skill

(Morrison vs. Altig (Ia.), 138 N. W. R. 510)

The Supreme Court of Iowa says incidentally, in this veterinary case, that even a practicing physician who informs a person employing him that he lacks experience or skill in the service he is asked to perform is charged with no liability on account of his professional incompetence. It cites Lorenz vs. Jackson, 88 Hun, 200; 34 N. Y. Supp. 652.

Society Proceedings

COMING MEETINGS

Am. Academy of Ophthal. and Oto-Laryn., Chattanooga, Oct. 27-29.
Amer. Assn. of Obstet. and Gynec., Providence, R. I., Sept. 16-18.
American Association of Railway Surgeons, Chicago, Oct. 15-17.
Assn. of Military Surgeons of the U. S., Denver, Sept. 16-19.
American Public Health Association, Colorado Springs, Sept. 9-13.
American Roentgen Ray Society, Boston, Oct. 1-4.
Colorado State Medical Society, Glenwood Springs, Oct. 7-9.
Delaware State Medical Society, Dover, Oct. 13-14.
Idaho State Medical Association, Pocatello, Oct. 9-10.
Indiana State Medical Association, West Baden, Sept. 25-26.
Medical Association of the Southwest, Kansas City, Mo., Oct. 7-8.
Minnesota State Medical Association, Minneapolis, Oct. 2-3.
Mississippi Valley Medical Association, New Orleans, Oct. 23-25.
Missouri Valley Medical Society, Omaha, Sept. 18-19.
Nevada State Medical Association, Reno, Oct. 14-16.
New Mexico Medical Society, Albuquerque, Oct. 2-4.
Utah State Medical Association, Salt Lake City, Sept. 23.
Pennsylvania State Medical Society, Philadelphia, Sept. 22-25.
Vermont State Medical Society, Burlington, Oct. 8-10.
Virginia Medical Society, Lynchburg, Oct. 21-24.
Wisconsin State Medical Society, Milwaukee, Oct. 1-3.

SEVENTEENTH INTERNATIONAL MEDICAL CONGRESS

August 6-12, 1913

(From Our Regular and Special London Correspondents)

(Concluded from page 893)

Section on Obstetrics and Gynecology

The Section opened August 7 under the presidency of Sir Francis H. Champneys with a discussion on "The Treatment of Hemorrhage from the Placental Site in the Late Months of Pregnancy." The essayists who introduced the discussion were Profesor Döderlein of Munich and Professor Essen-Möller of Lund. By arrangement the former confined his remarks to placenta praevia, and the latter to accidental hemorrhage. This accentuation of the natural tendency for the subject to fall into two divisions made the debate, it must be admitted, rather disjointed in character, but it became perfectly clear that the Section was unanimous in dividing all cases of hemorrhage into two groups for purposes of treatment: (1) Those for whom the facilities of a hospital or nursing home were available, and (2) those in which these were impossible. Practically every speaker urged this distinction and several, indeed, insisted that cases of hemorrhage were as clearly cases for treatment in nursing homes or hospitals as acute surgical conditions.

Professor Döderlein contributed an elaborate series of statistics of methods of treatment under the headings of (1) artificial dilatation by bags, (2) tamponade of the vagina, (3) Braxton Hicks' method, (4) intra-abdominal metreuryse, (5) abdominal cesarean section and (6) vaginal section. He favored operative measures, particularly vaginal cesarean section, for severe cases where facilities were possible, but was still prepared to keep an open mind on the subject, and all the more so since the more obstetrical methods gave a very low mortality. So far as the discussions related to placenta praevia, there appeared more or less a consensus of opinion that Braxton Hicks' method for most cases and cesarean section for severe cases with closed cervix gave the best prospects. Dr. Munro Kerr (Glasgow) urged that this latter should not be postponed till late. Dr. Murdoch Cameron was by no means enthusiastic for cesarean section, but Professor Recasens (Madrid) was sufficiently convinced of its merit to have done it in instances in which the child was dead. Professor Jardine (Glasgow) recommended pituitary extract for all cases of hemorrhage, but Professor De Lee (Chicago) pointed out that rupture of the uterus might follow this drug. Professor Davis (Philadelphia) regarded the condition as being essentially similar to ectopic gestation and therefore treated it on surgical lines. Prof. Paul Bar (Paris) and others called attention of the possibility of an aggravation of shock following section cases, but did not exclude it as a form of treatment. Professor Essen-Möller, limiting himself to the pathology and treatment of accidental hemorrhage, expressed his conviction that a small group of cases are directly attributable to trauma, but that the majority of cases have an association with albuminuria such as to suggest some general intoxication—some condition analogous to eclampsia. For treatment he advocated cesarean section (abdominal or vaginal) for serious cases with closed cervix when the condition made rapid delivery necessary; hysterectomy was only to be done when contraction remained obviously deficient after removal of the child or placenta. He doubted the efficiency of the Rotunda method and in cases of moderate severity would try the effect of rupture of the membranes. Discussing accidental hemorrhage Sir John Byers (Belfast) recommended the Rotunda method of packing, pituitary extract and isotonic salines. Professor Jardine (Glasgow) described two cases of concealed hemorrhage in which the condition was too serious for section and yet the patient recovered under pituitary extract, salines and morphin. Such cases pointed a moral. Dr. Hastings Tweedy (Dublin) described thorough plugging of the vagina and its fornices as being invariably successful in arresting bleeding; the patient, however, might still be in danger.

At the afternoon session (August 7) Professor Frank (Cologne) spoke enthusiastically in favor of subcutaneous symphysiotomy based on an experience of 117 cases. He did not consider infection to be a contra-indication. Professor Favre (Lyons) described an ingenious method of external hysterography. By means of a very simple apparatus which he showed, he had studied the uterine contraction during pregnancy, labor and post partum. Different types of contraction have been noted and it has been found possible to foretell the type of contraction in labor. The action of various drugs had also been studied with care. The communication was listened to with much interest.

At a joint meeting of Sections on Obstetrics, Pediatrics and Hygiene on Friday, August 8, Dr. Chalmers (Glasgow), Dr. Koplik (New York) and Professor Wallich (Paris) reported on the causes of death among infants during the first four weeks after birth. The first of these expressed the opinion that two-thirds of this mortality was to be ascribed to causes suggesting cell-deterioration in the antenatal state. This influence showed no dependence on surroundings and knew no geographical boundaries, but further tabulation of the causes of death in the days and weeks of the first month were urgently necessary for our further information.

Dr. Koplik expressed a somewhat similar opinion as to the importance of prenatal influences. The small quota of syphilis was probably due to the difficulties of diagnosis at so early an age. He considered that 60 per cent. of this deplorable mortality was due to a combination of these prenatal influences with ignorance, neglect and poverty.

Professor Wallich produced interesting statistics showing the variation between legitimate and illegitimate births and between home-nursed infants and those put out to nurse. The mortality from obstetric reasons was decreasing, but much remained to be done in correcting detrimental social conditions.

Many of the succeeding speakers emphasized the incidence of syphilis, more especially Miss A. Louise McIlroy (Glasgow), who startled the meeting by announcing that 49 per cent. of 100 unselected women from an outpatient clinic showed a positive Wassermann reaction. All the families of nine negative mothers also proved positive. This was regarded as indicating an unsuspected degree of latent syphilis.

Sir Francis Champneys decreed that it must be again made fashionable for women to nurse their own children; schools for prospective mothers would in the end prove a cheap investment for the state.

Other speakers were anxious that the statistics should be amplified by the compulsory notification of all cases of stillbirths, while some went so far as to recommend that pregnancy should be made a notifiable disease! Only thus, they said, would efficient supervision of the pregnant woman be obtained.

Dr. T. W. Eden hoped that wet-nursing would be reintroduced on a large scale; there was sufficient healthy human milk for all infants in the world and the whole difficulty was one of distribution.

In the afternoon session of the Section on Obstetrics Professor Pozzi (Paris) described his operation for opening up stenosed cervices associated with sterility, and was enthusiastically supported by Dr. H. Spencer, who regretted that this operation was not better known in England and America. Professor Beuttner (Geneva) recommended an original operation for chronic inflammatory disease of the appendages where it was possible to preserve one ovary, whereby a wedge of the uterine fundus was removed in one piece with the adnexa; the possibility of menstruation was thus left to the patient.

Miss A. Louise McIlroy (Glasgow) discussed some factors influencing the mammary secretion and was constrained to limit such to the ovary. She had failed to confirm Shäfer's experimental work on the galactogogue action of the pituitary gland.

Discussion on Roentgen and Radium Therapy

The Obstetrical and Radiological Sections met August 11, to discuss in joint session the subject of "Roentgen and Radium Therapy in Gynecology." Dr. Albert Schönberg (Hamburg) communicated his results in a paper amplified by carefully tabulated statistics. His report included forty-six cases of myomas, twenty-six of carcinomas, thirty-five of fibrosis uteri, a short series of menstrual abnormalities and some cases of pruritus vulvae; all of these were treated by x-rays. Experiments have proved that the rays have a definite deleterious influence on the male and female genital glands. Their influence on myomata, however, is not solely due to ovarian atrophy, but includes a direct action on the myomatous stroma. The great percentage of myomata did not disappear under treatment, but the percentage of complete relief from symptoms was high. Lasting cure was to be expected with certitude in favorable cases, but a certain number of myomata proved quite refractory; he did not consider that the indications for favorable cases were yet definite. He summed up the general indications for x-rays in gynecology as follows: 1. Induction of menopause. 2. Removal of post climacteric bleedings. 3. Soothing menstrual difficulties at all ages, if possible without sterilization. He preferred to use as few rays as possible and to regulate by a varying exposure. Hemorrhage might increase after the first or second dose, but later decrease.

Dr. Foveau de Courmelles (Paris) made it clear in his opening sentences that neither radium nor x-rays must be regarded as a panacea for all gynecologic ills. He had, however, treated fibroids for the past ten years with x-rays, and, when applied discriminately, was convinced of their great utility. His technic included aluminum filtration (1 mm. in thickness). Hemorrhages and pains or feelings of weight were usually the first to go, but young fibromas, even when of a large size, yielded rapidly. The action was much more rapid about the menopause, but failure occasionally occurred even after a preliminary improvement. Contra-indications were (1) polypi and (2) degenerating tumors. Discussing radium, Dr. Foveau de Courmelles gave a very favorable report in malignant diseases: Of 100 cases of inoperable carcinoma 70 per cent. had improved for from one to four years. The mobility of the uterus increased, hemorrhages and leukorrhea diminished and general improvement rapidly appeared. He applied 1 to 5 cgm. of pure radium to the neck of the uterus for from six to twenty-four hours. He hoped that bad as well as good results would be published.

Professor Kroemer narrated the excellent results obtainable with mesothorium in the treatment of malignant diseases. Professor Döderlein enthusiastically supported the claims of radium and mesothorium and showed lantern slides in natural color of cases in process of treatment. His emphatic stand greatly impressed his hearers. Dr. Jacobs (Brussels) preferred radium to radical operation in extensively malignant cases. He used massive doses and had had cures for from three to three and one-half years. Dr. Walter Tate had not yet seen postoperative recurrences disappear under the treatment. Professor Nagel (Berlin) gave his patients every opportunity of x-ray treatment by experts, but was not greatly impressed by the results. He gave the advice to the Section to "wait and see."

The discussion as a whole was very favorable to nonoperative treatment, but Dr. Spencer emphasized some of the dangers. He considered that every case treated should be at the same time under the care of a gynecologist, and pointed out the possibilities of degeneration or malignancy and the disadvantage of sterilization.

Space will allow only brief comment on the more important topics in the other sections.

The Nature of Cancer

At a combined meeting of the Sections of Chemical Pathology and Bacteriology, held on "The Nature of Cancer," Dr E. F. Bashford, Director of the Imperial Cancer Research Fund, opened the discussion. As the result of the work done by himself and his co-workers for several years on the lower animals, supplemented by observations of the conditions under which cancer occurs in all parts of the world in man, he concluded that it was unlikely that a parasite played any part in the causation. All we know for certain is that some form of irritation is traceable in practically every form. Dr Freund of Vienna was the next speaker. He had been able to demonstrate substances in normal cells which are antagonistic to cancer, and substances in cancer cells which stimulate them to further work. The former substances prevent cancer but the latter destroy the former. Dr. Clowes of Buffalo thought that the equilibrium of the cancer cell depends on the equilibrium of its membrane, which in its turn depends on the equilibrium of the lipoid content of the cells, or, in other words, on its electrolytic content.

The Prevention of Typhoid Fever

In the Section of Naval and Military Medicine a discussion on "Prevention of Typhoid Fever" was opened by Professor Vincent of the Val-de-Grace Hospital, France. After prolonged consideration and experiment the French military authorities decided to introduce inoculation against typhoid fever as a voluntary measure at the beginning of 1912. It is now obligatory in the African colonies. Unpleasant effects rarely occurred and were, as a rule, due to the patient being in an unsuitable condition, ill, tired or recovering from a disease. The vaccine used was polyvalent, being the result of the cultivation of ten different strains of the bacillus; it contained 400 millions of bacilli per c.c. The results have been most satisfactory. In Eastern Morocco not one man of 992 vaccinated contracted typhoid fever, whereas among those not vaccinated 4 per cent. were attacked, and of these one in seven died. Col. Sir William Leishman followed with a description of the work done in the British Army, especially in India. Contrary to the French method, the vaccine was made from only one strain of the bacillus, but the results were no less satisfactory. In the ensuing discussion attention was drawn by several speakers to the great value of vaccine treatment in the course of the disease.

"Hormones" and "Chalones"

In the Section of Physiology the most important paper was that on the internal secretion by Prof. Schäfer. He pointed out that convenient term "hormone" introduced by Starling (from ὁρμάω, I excite) while applicable to the active principle of many internal secretions, had been extended to all and was wrongly applied to principles which did not excite, but checked activity. For these he suggested the term "chalone" (from χαλάω, I relax). It was, however, desirable to have a term which included both the hormones and chalones. The one quality which distinguished them was their drug-like effect on the organs and tissues. A convenient term, suggested by Prof. W. R. Wardie, was autacoid substance.

Radium in Dermatology

In the Section of Dermatology, Mr. Hayward Pinch, director of the Radium Institute, London, opened a discussion on the use of radium in skin diseases. He held that radium was the best treatment for many diseases, such as rodent ulcer, warts and painful corns. Certain forms of eczema of a chronic localized type yielded to one application of the half-strength applicators, while psoriasis—though as with every treatment recurrent—disappeared for some time after a dose of only five minutes' duration. Moles and deep-seated vascular nevi—dangerous to attack with the knife—vanished completely if patiently treated. For keloid radium was the only treatment of value. The leaders of the French school of radium therapy, Wickham, Degrais and Bellot, followed and amply confirmed the English experience.

Treatment of Syphilis

Perhaps the meeting of the Congress which attracted the most attention was a joint session of the sections of Dermatology and Syphilography and of Naval and Military Medicine on the treatment of syphilis by salvarsan and allied substances. The discussion was opened by Professor Ehrlich. He agreed with those authorities who maintained that the action of salvarsan is not direct, but requires a third factor for its completion, which must be sought for in the tissue fluids of the body. Salvarsan could be anchored by the spirochetes in the test-tube but they were not killed. This could be completed only in the living body. He next discussed the toxicity of salvarsan. He had found that rabbits were killed by 0.1 to 0.12 gm. of the alkaline solution, while the acid solution was still more poisonous. He then passed to the febrile reactions observed in its therapeutic use. Some of these were due to technical errors of administration or to administration in the roseolar stage, when the body is saturated with spirochetes. The febrile reaction was due to destruction of the spirochetes and setting free of their toxins. It could be prevented by previous preliminary treatment with mercury. As to the recurrences, about which so much had been written, his opinion was that they were due to insufficient treatment and that a good many deaths were due to the same cause. The mortality after two or three million injections compared very favorably with that of chloroform anesthesia. There were frequent deaths from mercurial treatment, many of which were not recorded. It is curious that Professor Ehrlich did not allude to the fact, attested from many quarters, that deaths from salvarsan have also been suppressed. Deaths with cerebrospinal symptoms were due to want of care in selection of the cases. Here again he did not face the fact that in one well-known type of fatal case coma and convulsions occur, and it has repeatedly been recorded that the patients were young and robust and apparently ideal subjects for salvarsan Nor did he refer to the fact that this result and others, such as jaundice, nephritis and eruptions, can only be explained as manifestations of arsenical poisoning. Deaths could be avoided, he said, by giving very small initial doses. In the discussion which followed Lieut.-Colonel Gibbard said that he had obtained the best results from a course of two injections of 0.6 gm. salvarsan and nine intramuscular injections of mercury prolonged over nine or ten weeks. In over 3,000 injections of salvarsan there had not been a single death. Professor Wassermann said that the experiences at his laboratory had shown that before the introduction of salvarsan it was rare for a positive reaction of the blood to be converted into a negative one. In cases of fresh infection it was easy by salvarsan to convert a positive into a negative reaction. But if the infection had existed for three or four years it was difficult to remove the positive reaction. This he thought was due to adaptation of the spirochete to its environment. Hence the importance of attempting to sterilize the patient in the early stage. If symptoms of infection of the central nervous system were present it was doubtful whether sterilization could ever be accomplished. Professor Hata, the collaborator of Ehrlich in the discovery of salvarsan, stated the results which had been obtained under his direction in the hospitals of Japan. In 166 cases thirteen relapses had occurred within periods varying from six months to a year. Professor Blaschko of Berlin advised caution in speaking of cures. An interval of ten years must elapse before this could be done. Dr. Fordyce of New York had given between 6,000 and 7,000 injections with only one death. He found that in early cases six injections of salvarsan with ten or twelve of mercury were sufficient. In secondary cases he gave several such courses. Dr. Levy-Bing of Paris said that in twelve cases of early syphilis injected from the third to the thirteenth day after the appearance of the chancre seven had relapsed within a year. In replying Professor Ehrlich said that there were dangers from the administration of too much salvarsan on the one hand and too little on the other. If the drug had not been proved to fulfil the results which he had at first hoped for, at any rate it was a valuable adjunct in the treatment of syphilis.

State Control of Syphilis

At a joint session of the Section of Dermatology and Syphilography with the Section of Forensic Medicine a discussion took place on "Syphilis: Its Dangers to the Community and the Question of State Control," opened by Professor Blaschko (Berlin) who related how the German Society for the Prevention of Venereal Diseases was founded in 1902. This society was consulted by the government, and many laws were passed at its instigation. The regulation of prostitutes had never been of the slightest use in diminishing disease, for it missed the most important class—the young clandestines. Police supervision of any kind was unsatisfactory. A board of health should be constituted and a system of registration of disease applied to both sexes. Professors Gaucher and Gouterot of Paris also condemned the state regulation of prostitutes. They recommended education of the young, organized treatment of syphilitic prostitutes, suppression and prevention of prostitution by the recognition of paternity, and the conferring on seduced virgins the rights of wives. Dr. Woods Hutchinson (New York) recommended notification which in the form of an anonymous communication by the physician was rendering excellent service in New York. The following resolution was adopted unanimously:

> That, sensible of the ravages wrought by syphilis in the community and deploring the inadequacy of existing facilities for the checking of its dissemination, the International Medical Congress calls on the governments of all the countries here represented (1) to institute a system of confidential notification of the disease to a sanitary authority where such notification does not already obtain, and (2) to make systematic provision for the diagnosis and treatment of all cases of syphilis not otherwise provided for.

This resolution was also adopted by the whole congress at the closing general meeting.

The Increase of Lunacy

Sir James Crichton-Browne, the President of the Section of Psychiatry, gave an address in which he stated that all countries from which trustworthy statistics were available showed an increase in the number of lunatics out of proportion to the increase of the population. Comparing the United Kingdom of to-day with it in 1859, the notified insane had increased by 276 per cent. while the population had increased only by 87 per cent. This disquieting fact cannot be fully accounted for by more accurate registration, or by accumulation in asylums of chronic patients. There seemed to be no good reason why insanity should have increased while the health and material condition of the people had markedly improved. The segregation in asylums of a growing number of the insane during the period of sexual activity ought to have diminished hereditary insanity. There were also other factors which should have checked insanity—the diminished consumption of alcohol, the better treatment of tuberculosis and the diminution of puerperal sepsis and syphilis.

The Prevention of Beri-Beri

In the Section of Tropical Medicine a discussion was held on beri-beri in which most of the present-day investigators of the etiology of the disease took part. Professor Eijkmann of Utrecht pointed out that from the standpoint of the deficiency theory it should be remembered that the need of the body for vitamine varied somewhat in the individual, sex, mode of life, occupation, residence, climate and season. The following resolutions were carried by a large majority:

> 1. In the opinion of this section beri-beri among natives, whose staple food is rice, is induced by the continued and too exclusive consumption of the grain in its highly milled form, by which treatment the cortical and subcortical layers are removed.
>
> 2. The section urges on all authorities responsible for the health of native communities the encouragement, by every means in their power, of the restriction of the use of rice of this kind.
>
> 3. In view of the proved non-infectiousness of beri-beri, the section suggests to all port authorities the propriety of abolishing quarantine and the restrictive measures at present in operation.

These resolutions were also adopted by the whole congress at the closing meeting.

The Museum of the Congress

The Museum of the Congress contained 4,000 different exhibits illustrating for the most part various aspects of recent medical progress, arranged according to the various sections. For the first time there was a department devoted to museum technic. This departure was due to the initiative of the International Association of Medical Museums and was carried out by Dr. Maude E. Abbott. Beautiful specimens were exhibited by Professor Spalteholz of Leipsic showing his method of rendering tissues transparent. Professor Houser of Erlangen showed a series of sections through the whole of the body in different directions.

Professor Wahby of Cairo exhibited the results of injecting various vessels with fusible metal to show their branches. Dr. R. H. Clarke showed a remarkable apparatus by which any particular part in the brain may be localized and reached without damage to adjacent parts. It consisted of a framework placed horizontally on the head, above which was a corresponding frame. On the upper frame was a traveling crosspiece arranged to move either backward and forward or from side to side. It carried a needle, by raising or lowering of which the point could be brought to any part of the brain. Specimens had been brought from all over Europe to illustrate the development of the ovum. A remarkable and apparently so far unique specimen was shown by Dr. F. J. M. McCann of London. It was an ovarian pregnancy in which a four-month fetus was situated in one of the cavities of a multilocular ovarian cyst. The exhibit of Dr. Edwin F. Smith of the United States Department of Agriculture, showing a disease of plants produced by inoculation with a microbe which he claimed to be analogous to cancer in animals, attracted much attention.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Anatomy, Philadelphia

July, XV, No. 1, pp. 1-127

1 Postnatal Growth and Variability of Body and Various Organs in Albino Rat. C. M. Jackson, Columbia, Mo.
2 Muscle Degeneration and Its Relation to Origin of Eosinophil Leukocytes in Amphibia (Salamandra Atra). J. A. Badertscher, Ithaca, N. Y.
3 Weights of Abdominal and Thoracic Viscera, Sex Glands, Ductless Glands and Eyeballs of Albino Rat (Mus Norvegicus Albinus) According to Body-Weight. S. Hatai.
4 *Nucleus Cardiacus Nervi Vagi and Three Distinct Types of Nerve Cells Which Innervate the Three Different Types of Muscle. E. F. Malone, Cincinnati.

4. **Nucleus Cardiacus Nervi Vagi.**—Malone says that the histologic character of a nerve cell is an indication of its function. Differences in connections with portions of the organism which differ merely in spatial relations do not involve a difference in the character of the nerve cells, but are associated merely with the location of the nerve cell; for instance, arm and leg muscles, flexors and extensors are all innervated by the same type of cell, although such differences in peripheral connections correspond to differences in the position of the corresponding nerve cells. The three types of muscle are innervated by three distinct types of nerve cell, which, however, are related to one another in such a manner that the cell innervating heart muscle is of a type intermediate between the other two types of cells. The nucleus cardiacus nervi vagi is situated in the middle portion of the sympathetic nucleus of the vagus.

American Journal of Obstetrics and Diseases of Women and Children, York, Pa.

August, LXVIII, No. 428, pp. 201-400

5 *Emptying Uterus as Method of Treatment of Puerperal Eclampsia. R. Peterson, Ann Arbor, Mich.
6 *Elastic Area in Isthmus of Uterus a Positive and Early Sign of Uterine Pregnancy. L. J. Ladinski, New York.
7 Points in Technic. B. F. Baer, Philadelphia.
8 Renal Calculus in Relation to Kidney and Ureter. S. E. Tracy, Philadelphia.
9 Ovarian Teratomas. C. S. White, Washington, D. C.
10 Leukoplakia Uteri. T. T. Sweeney, New York.

11 Patent Ductus Arteriosus: Report of Case Complicated by Pregnancy. L. B. Rosenthal, New York.
12 Clinical Significance of Urine in Pregnancy. H. C. Bailey, New York.
13 Famous Case of Mary Toft, Pretended Rabbit Breeder of Godalming. C. G. Cumston, Boston.

5. **Treatment of Puerperal Eclampsia.**—Since the cause of eclampsia is still unknown, Peterson emphasizes that its treatment must of necessity be empirical. In a large series of cases of eclampsia prompt delivery gave a maternal mortality of 15.9 per cent., as compared with a maternal mortality of 28.9 per cent. where the delivery was long delayed. Where the uterus is emptied immediately or very soon after the onset of the first convulsion, the maternal mortality is still lower. While in a large group of cases the maternal mortality is 5 per cent. in favor of conservative treatment and spontaneous labor in cases occurring before 1900, between 1900 and 1912, on account of better and more prompt obstetric surgery, the figures are reversed and show that the maternal mortality is lower by 4 per cent. after the radical opposed to the conservative treatment of the complication. Therefore, the treatment of antepartum eclampsia should consist of emptying the uterus as quickly as possible after the onset of the first convulsion. The operative procedure which will empty the uterus the quickest with minimum trauma and shock to the eclamptic mother and child should be selected.

6. **Elastic Area in Isthmus of Uterus.**—The change which Ladinski has invariably found in early uterine pregnancy (first published six years ago) consists of a circular area situated in the median line of the anterior surface of the body of the uterus, just above the junction of body and cervix, that is to say, at the isthmus of the uterus, which varies in size according to the duration of pregnancy, and offers to the palpating finger the distinct sensation of elastic fluctuation. It can frequently be made out as early as the fifth week, when the area is only the size of a fingertip; but it can always be felt in the sixth week, when it is somewhat larger. As pregnancy advances this area increases in size in a crescentic manner, and extends upward toward the fundus until the third month of pregnancy, when nearly the entire anterior body of the uterus presents a fluctuating, cystic feel to the examining finger. The change in the consistency is observed in the anterior wall when the pregnant uterus is in the normal position or slightly retroverted; in extremely retroverted or retroflexed uteri the elastic area is found in the posterior wall, but the sign is usually felt a week or so later than in uteri of normal position.

Bimanual palpation is a prerequisite in eliciting this sign; while the uterus is fixed by counterpressure with the external hand, the anterior wall of the uterus, from the tip of the cervix to the fundus, is palpated with the internal finger or fingers, and if pregnancy exists, the elastic fluctuating area will be felt in the median line of the body of the uterus, immediately above the cervix. Ladinski says that there is no special skill or dexterity required to recognize this elastic area; the ordinary technic and tactile sense necessary in the performance of bimanual palpation will readily detect the difference in the consistency of the isthmus, and a proper interpretation of the character of this change will invariably establish a correct diagnosis. This can be done by the general practitioner as readily as by the specialist; a fact that enhances the importance and value of the sign.

As the result of a careful study of extensive clinical material, Ladinski concludes that this sign is not only constant and reliable and can be detected with greater ease than any other objective sign, but that it is undoubtedly the earliest sign of pregnancy. He insists that any change from the normal in the consistency of the isthmus of the uterus may be regarded with suspicion of pregnancy. The only conditions that show a change in the consistency of the isthmus, are pregnancy, subinvolution, that is, the result of pregnancy, and cystic tumors in the anterior wall of the uterus. In subinvolution, following delivery at term or abortion, there is a change in the same area, but the feel is very soft and doughy, in contradistinction to the tense, elastic and cystic feel of pregnancy. However, in the presence of a soft myoma, or cystic fibroid in the anterior wall of the uterus, the elastic feel elicited in the uterine wall is almost identical with that of pregnancy; and this is the only condition which cannot be differentiated from early pregnancy at the first examination. This is especially true when a soft myoma of the uterus is associated with amenorrhea, as is frequently the case. Under these circumstances further observation and repeated examinations will be necessary to establish a diagnosis.

American Journal of Tropical Diseases and Preventive Medicine, New Orleans

August, I, No. 2, pp. 113-192

14 Further Experiences with Beri-Beri in Philippine Islands. V. G Heiser, Philippines.
15 Character of Rice Which Prevents Beri-Beri and Manner in Which It Is Milled. W. P. Chamberlain, U. S. Army.
16 Polyneuritis Gallinarum Caused by Different Foodstuffs. C. Wellman and C. C. Bass, New Orleans.
17 Peripheral Neuritis in Amazon Valley. C. Lovelace, Porto Vallo, Brazil, S. A.
18 Sprue in Porto Rico and Results of Treatment by Yellowed Santonin. B. K. Ashford, U. S. Army.
19 White Race and Tropics. J. Guiteras, Havana, Cuba.

Archives of Internal Medicine, Chicago

August, XII, No. 2, pp. 117-244

20 *Study of Ventricular Systole-Subclavian Interval, with Discussion of Presphygmic Period. A. W. Swann and E. R. P. Janvrin, New York.
21 *Relation of Hypophysis to Growth and Effect of Feeding Anterior and Posterior Lobe. D. D. Lewis and J. L. Miller, Chicago.
22 Study of Hydrogen Ion Concentration of Urine in Heart Disease. L. H. Newburgh, W. W. Palmer and L. J. Henderson, Boston.
23 *Effect of Diuretic Drugs on Life of Animals with Severe Acute Nephritis. C. Walker and R. P. Dawson, Boston.
24 Bacteriology of Duodenum. W. J. MacNeal and A. F. Chace, New York.
25 Frequency of Low Polymorphonuclear Leukocyte with High Lymphocytic Differential Counts. H. G. Mehrtens, San Francisco.
26 Case of Acromegaly and Polyglandular Syndrome, with Special Reference to Pineal Gland. F. K. Bartlett, Chicago.
27 *Functions of Diaphragm and Their Diagnostic Significance. C. F. Hoover, Cleveland.
28 *Demonstration of Variations in Thyroid Colloid in Conditions of Hyper- and Hypothyroidism. A. P. Jones and A. L. Tatum, Madison, Wis.
29 *Source of Urinary Indol-Acetic Acid in Two Dementia Praecox Patients. E. L. Ross, Kankakee, Ill.
30 *Cultural Results in Hodgkin's Disease. C. H. Bunting and J. L. Yates, Madison, Wis.
31 Clinical Studies on Acid Base Equilibrium and Nature of Acidosis. W. W. Palmer and L. J. Henderson.

20. **Ventricular Systole.**—The following summary is made by Swan and Janvrin of their work: The normal V_s-S time is from .085 to .10 second. It varies widely in certain abnormal conditions of the heart and circulation. The presphygmic period, as determined by calculation from simultaneous tracings of the apex beat, subclavian and radial pulses, is about .015 second shorter than the V_s-S time, and runs parallel to it, variations in one fairly accurately representing vairations in the other. They doubt the accuracy of the presphygmic period as obtained by this method and hope to settle this point more definitely in future work. In cases of auricular fibrillation the variations in the V_s-S time depend on: (a) the length of the preceding diastole, and (b) the strength of the preceding systole or systoles; being longest after a short diastole, and a strong systole, and *vice versa.* After diastoles of a certain length, however, the length of the V_s-S time varies little or not at all. From figures obtained in three cases, the length of diastole necessary for complete rest apparently lay between .322 and .330 second. In cases of broken compensation, the mean V_s-S time was invariably lengthened, except when a marked degree of arteriosclerosis was present. It is probable that, when no disturbing factors coexist, the length of the V_s-S time may be of value in estimating the capability of the heart muscle.

In every one of five cases on which tracings were taken with the patients lying and standing, the V_s-S time was definitely longer in the erect posture. As by far the greatest lengthening occurred in the two cases which were clinically regarded as having the least competent hearts, it is probable that the degree of lengthening may prove to be of value in prognosis. Aortic regurgitation shortens, and mitral valve lesions lengthen, the V_s-S time. Combined lesions, having opposite effects, tend to offset one another. A marked degree of arteriosclerosis shortens the V_s-S time. The relation of the V_s-S time to blood-pressure is not constant. It tends, however, to become shortened when the pulse pressure is high, especially if at the same time the diastolic pressure is low. The opposite also holds good. Split "C" waves in the jugular tracings were not associated with abnormally long V_s-S times. The speed of the pulse wave in the arm varies with extremes of blood-pressures, being faster in cases with high, and slower in cases with low, blood-pressure. This relationship, however, is not constant. No other factors seem to have any definite effect on the pulse speed. Although it varies widely in different individuals, it is nearly always constant in a given vessel of the same individual.

21. **Relation of Hypophysis to Growth.**—Summarizing the entire field of the rôle of the hypophysis in the growth of the individual in acromegaly in which there exists abnormal development of certain portions of the body, especially in their bony structures, Lewis and Miller state there is apparently hypersecretion of the anterior lobe. In the Fröhlich syndrome of adiposity and failure of sexual development, it is thought by many that there is lessened function of the posterior lobe; experimental information, however, suggests lessened secretion of the anterior lobe, but evidence on this point is not especially convincing. Regarding studies in metabolism in patients with acromegaly, there is again nothing conclusive, and more work must be carried out on this subject before it can be accepted that lessened katabolism takes place as compared with the normal individual.

Turning to the results of partial removal of the hypophysis in animals, only one point having a direct bearing on this subject seems to have been determined, viz., that partial removal of the anterior lobe, when performed on young animals, modifies growth and sexual development in such a manner as to resemble very closely the Fröhlich syndrome. Removal of the posterior lobe, apparently, has no effect on growth. This is a distinct contradiction to those who believe lessened function of the posterior lobe is responsible for the Fröhlich syndrome. Feeding experiments, on animals, fail to furnish any definite evidence that the administration of either the anterior or posterior lobe has any effect on growth.

23. **Effect of Diuretic Drugs on Life of Animals with Severe Acute Nephritis.**—The following conclusions are made by Walker and Dawson from their work and it is held that they suggest a similar effect in man. The diuretic drugs, theocin, caffein and potassium acetate definitely shorten the life of a rabbit having a severe acute experimental nephritis produced by uranium nitrate. Theocin and potassium acetate gave quite parallel results and were slightly more harmful than caffein. Spartein sulphate, although not nearly so detrimental as the other drugs, however, did, in some cases, shorten the animal's life. Water in large amounts is detrimental in some cases, possibly depending on the severity of the nephritis. The diuretics alone in large doses and water alone in large doses when given intravenously to normal animals for a reasonable length of time do not shorten their life and probably are not toxic in themselves. Diuretics are probably contraindicated in severe acute nephritis in man, since in animals in such cases they shorten life.

27. **Functions of Diaphragm.**—Movements of the costal borders during respiration, Hoover found, give valuable aid in differentiating between supraphrenic and subphrenic disease. Also in differentiating between pulmonary consolidation and pleurisy with effusion, and in differentiating between obsolete pleurisy and pleuritic effusion.

Costal border movements enable us to form a comparative estimate of a degree of pulmonary emphysema which exceeds mere filling of the pleural sinus with aerated lung. Movements of the costal borders give indication of the amount of fluid in a pericardial sac and also contribute to an appreciation of cardiac enlargement and an appreciation of the relative enlargements of the two ventricles. Unlike the diaphragm phenomenon of the pleural sinus, these movements of the costal borders and the subcostal angle are always present and can be accurately observed whatever the disease may be and however thick may be the panniculus adiposus. So these signs have a much broader and more accurate diagnostic significance than the so-called Litten diaphragm phenomenon. In making an estimate as to whether a costal border is stationary or diverges from, or is drawn toward the median line, the examiner should apply his thumbs symmetrically placed along the costal borders to serve as indicators. Inspection alone without the aid of palpation of the borders may lead to confusion between elevation of the thoracic cage and widening of the subcostal angle. The thoracic cage may be strongly elevated and still the subcostal angle remain the same size. In fat persons, asymmetrical movements of the costal borders may be obscured without the aid of indicatory palpation.

28. **Variations in Thyroid Colloid.**—The iodin content of the thyroid glands of rabbits serving as test animals was found by Jones and Tatum to be increased directly by feeding commercial desiccated thyroids, and indirectly, by intravenous injections of serum from hyperthyroid rabbits. The iodin content of the thyroid gland was found to be decreased by intravenous injections of serum of thyroidectomized rabbits. Following normal serum injections, the iodin content was sometimes increased, sometimes decreased, or remained constant, indicating individual variations in thyroid activity.

29. **Source of Urinary Indol-Acetic Acid in Dementia Praecox.**—The urinary indolacetic acid in the case of two patients studied by Ross was endogenous.

30. **Cultural Results in Hodgkin's Disease.**—In three cases of Hodgkin's disease Bunting and Gates secured a pure culture of a pleomorphic diphtheroid organism. In two other cultural attempts the organism was recognized, but was not secured in pure culture, and in a sixth case a similar organism, morphologically, was stained in the lesions of a primary intestinal Hodgkin's case. The detailed biologic reactions of this diphtheroid organism have as yet not been completely worked out by them. The strain recovered from the second case, however, has been found to grow readily at 37 C. on the media used to secure the cultures and on ordinary agar-agar. On glycerin-phosphate-agar the growth is almost as luxuriant under strict anaerobic as under aerobic conditions. For luxuriant growth, marked moisture of the medium seems necessary. On a relatively dry medium, growth is slow, and the organisms are found to develop as the long forms, granular, banded, and with many club-shaped involution forms. Branching forms are also noted. These forms are especially well developed on the egg-medium, where they also seem to have a tendency to cohere, so that in stained smears one gets many small groups of organisms radially arranged, with clubbed peripheral elements, somewhat suggestive of a minute actinomyces colony, as seen in section. On moist serum tubes with luxuriant growth, the organisms are short and plump, with polar staining. Many of these forms are coccoid. The authors have noted also, as emphasized by Negri and Mieremet, that in all old cultures coccoid forms predominate, and also that large spherical involution forms are present. A colony or a streak, which at twenty-four hours shows entirely the bacillary form, will twenty-four or forty-eight hours later show an apparent outnumbering of the bacilli by the coccoid elements. The organism stains by the Gram method, though the short plump forms hold the dye less strongly than the longer bacillary forms. It is not acid fast. No spore formation has been noted. The growth of the organism is at first glistening and grayish, but becomes more opaque and of a white color. Apparently, depending somewhat on the reaction of the media, there may be in some early cultures a slight greenish-yellow tint produced. Old cultures on glycerin-phosphate-agar become brownish, and the media itself darkens. Gelatin is not liquefied. There is no early change in reaction in litmus milk. Bouillon is not clouded by the growth. Flecks appear along the side

of the tube, and a slimy deposit gradually accumulates at the bottom. Plate cultures show a rounded colony with quite regular edge, a fine stippling of the growth and a central dark spot. The colonies are of a glistening gray color at the end of twenty-four hours, becoming gradually of an opaque white color. Altogether, these studies thus far seem to indicate that the authors were dealing with the same organism described by Negri and Mieremet.

Arkansas Medical Society Journal, Little Rock

August, X, No. 3, pp. 67-90

32 Pyelitis; Its Differential Diagnosis. M. D. Ogden, Little Rock.
33 Vital Statistics. F. L. Watkins, Jackson, Miss.
34 Inquiry into Pathology of Dysmenorrhea. C. S. Pettus, Little Rock.
35 Optic Hazard in Obstetric Practice. W. Breathwit, Pine Bluff.

Boston Medical and Surgical Journal

August 21, CLXIX, No. 8, pp. 261-296

36 Need of Re-Organization in Methods and Teaching of Therapeutics. G. Blumer, New Haven, Conn.
37 Vichy, Royat, Aix-Les-Bains. Which? K. C. Mead, Middletown, Conn.
38 *Prognosis and Treatment of Compound Fracture of Base of Skull. A. C. Burnham, New York.
39 *Conclusions from Experiment in Teaching Pharmacology. A. C. Crawford, Palo Alto, Cal.
40 Abdominal, Lumbo-Ilio-Sacral Support and Its Uses, Advantages and Limitations. H. W. Marshall, Boston.

38. **Compound Fracture of Base of Skull.**—Burnham has analyzed thirty-five cases of compound fracture of the base of the skull admitted to the Presbyterian Hospital, New York City, between June 1, 1908, and January 1, 1913. These cases all presented the classical picture of fracture of the base of the skull to which was added bleeding from the nose, mouth or ear. Cases which were surely basal fractures, but in which there was some doubt as to the diagnosis of compound fracture, were not included in this report.

Of these thirty-five patients fourteen died and twenty-one recovered, a general mortality of about 40 per cent. Six patients died during the first forty-eight hours, all in primary shock from the injury received. Eight patients died after the third, and before the fifteenth day, after having partially or wholly recovered from the shock of the injury: Of the eight patients, five died of meningitis. The causes of death and the day on which it occurred in the fatal cases are as follows: Five patients died of meningitis on the fourth (2), sixth (2), and thirteenth day, respectively. Two patients died of broncho-pneumonia on the fourth day. One patient died on the tenth day after secondary hemorrhage and operation.

From these figures it may be seen that, even in those patients who survive the primary shock following compound fracture of the base, there is still a high mortality—in this series 25.5 per cent.

39. **Experiment in Teaching Pharmacology.**—Crawford has become convinced that pharmacology should, like physiology, be taught as a pure science, as much in connection with the university as with the medical school, while the practical applications of pharmacology should be in the hands of scientifically trained clinicians who are specializing in therapeutics and who would be in closer touch with the medical work. Insofar as this point of view is concerned, the necessity for any separation of the department of pharmacology from the university seems unfortunate, as it would tend to lay too much emphasis on the attainment of immediate practical results, and by this separation many pure scientific workers would be lost to pharmacology. For economic reasons it is usually more expedient to have the department of pharmacology in connection with the medical school, but under ideal conditions all of the medical school should be in close relation with the rest of the university. The tendency of teaching in pharmacology is to overload the student with facts, whereas the main purpose should be to teach him to think logically and judicially in this field. It seems to Crawford that emphasis should be laid on the laboratory teaching pharmacology. Pharmacology has now become such a large field of knowledge that it hardly seems fair to expect one man to teach it along with another branch, such as clinical therapeutics, because the experience required to successfully teach clinical therapeutics is of a different kind from that required to teach pharmacology, and one is very apt to neglect one subject for the other. Many schools now recognize that there are two sides to modern therapeutics and to meet this are offering courses in experimental therapeutics. Such courses must be really an extension of the work in pharmacology, pathology and bacteriology. Successful teaching in pharmacology depends on the man, not on the rules.

Cleveland Medical Journal

July, XII, No. 7, pp. 465-512

41 Operative Treatment of Fractures. W. Bartlett, St. Louis.
42 Urethroscope: Its Importance in Urethral Pathology, Diagnosis and Treatment. S. Englander, Cleveland.
43 Cholecystectomy versus Cholecystostomy. G. W. Crile, Cleveland.
44 Physiology of Sleep. L. W. Potts, Cleveland.
45 Cause of First Respiration. H. V. Weihrauch, Cleveland.

Indiana State Medical Association Journal, Fort Wayne

August 15, VI, No. 8, pp. 339-384

46 Hydronephrosis Produced by Experimental Ureteral Obstruction. G. D. Scott, Sullivan.
47 Luetin Test in Syphilis. C. G. Beall, Fort Wayne.
48 Treatment of Syphilis. W. S. Ehrich, Evansville.
49 Gonorrhea in Relation to Pregnancy and Puerperal Period. A. S. Jaeger, Indianapolis.
50 Cause and Treatment of Convergent Squint. A. E. Bulson, Fort Wayne.
51 Sympathetic Ophthalmia, with Recovery. F. C. Heath, Indianapolis.

Journal of Biological Chemistry, Baltimore

August, XV, No. 2, pp. 197-383

52 *Colorimetric Determination of Epinephrin in Desiccated Adrenals. A. Seidell, Washington, D. C.
53 *Nature of Depressor Substance of Dog's Urine and Tissues. A. E. Taylor and R. M. Pearce, Philadelphia.
54 Derivation of Ethyl Alcohol Contained in Muscle. A. E. Taylor, Philadelphia.
55 Nature of Sugars Found in Tubers of Arrowhead. K. Miyake, Sapporo, Japan.
56 *Action of Rennin on Casein. A. W. Bosworth, Geneva, N. Y.
57 Formation of Indophenol at Nuclear and Plasma Membranes of Frogs' Blood-Corpuscles and Its Acceleration by Induction Shocks. R. S Lillie, Philadelphia.
58 Dominance of Roquefort Mold in Cheese. C. Thom and J. N. Currie, Washington, D. C.
59 Volatility of Sulphuric Acid when Used in Vacuum Drying. H. C. Gore, Washington, D. C.
60 Racemization of Proteins and Their Derivatives Resulting from Tautomeric Change. H. D. Dakin and H. W. Dudley, New York.
61 Action of Enzymes on Racemized Proteins, and Their Fate in Animal Body. H. D. Dakin and H. W. Dudley, New York.
62 Determination of "Urea Nitrogen" in Cultures of Certain Bacteria. A. I. Kendall and A. W. Walker, Chicago.
63 Influence of Starvation on Creatin Content of Muscle. V. C. Myers and M. S. Fine, New York.
64 Relation of Growth to Chemical Constituents of Diet. T. B. Osborne and L. B. Mendel, New Haven, Conn.
65 *Influence of Carbohydrate Feeding on Creatin Content of Muscle. V. C. Myers and M. S. Fine, New York.
66 Elimination of Ingested Ammonium Salts in Dog on Adequate Mixed Diet. F. P. Underhill, New Haven, Conn.
67 Elimination of Ingested Ammonium Salts During Period of Prolonged Inanition. E. P. Underhill, New Haven, Conn.
68 Utilization of Ammonium Salts with Non-Nitrogenous Diet. F. P Underhill and S. Goldschmidt, New Haven, Conn.
69 Communications of Folin and Denis. E. Abderhalden.
70 Cerebrosides of Brain Tissue. P. A. Levene, New York.
71 *Influence of Pancreatic and Duodenal Extracts on Glycosuria and Respiratory Metabolism of Depancreatized Dogs. J. R. Murlin and B. Kramer, New York.

52. **Colorimetric Determination of Epinephrin.**—Attention is called by Seidell to the defects of the previously proposed potassium iodate method for commercial suprarenal glands and explanations of the sources of error in it are given. The phosphotungstic acid method of Folin and Denis has been applied to a series of desiccated suprarenals and, although it possesses many excellent features, certain disadvantages which apparently render it unsuitable for the standardization of commercial glands, are pointed out. The gold chlorid reagent was

found to yield a maximum color only when a definite ratio was maintained between the amount of epinephrin and of gold, thus seriously restricting the practical quantitative application of this reagent. The new method proposed in the present paper consists in the use of manganese dioxid as the reagent for developing a color with aqueous epinephrin solutions or suprarenal gland extracts. The color so developed is estimated by comparison with artificial color standards made by mixing cobalt chlorid, gold chlorid and water.

53. **Depressor Substance of Urine and Tissues.**—The author's attempts to isolate by the methods of Kutscher, Lohmann and Engeland the depressor substance occurring in the urine, pancreas and duodenal loops of the dog, and which have an effect on blood-pressure analogous to that of B-iminazolylethylamin, failed.

56. **Action of Rennin on Casein.**—The conclusions drawn by Bosworth from his investigation are as follows: A solution of calcium caseinate neutral to litmus and free from all other salts is not curdled by rennin. A solution of calcium caseinate acid to litmus, which contains two equivalents of base for each molecule of casein, is curdled by rennin. Solutions of ammonium, sodium or potassium caseinates are not curdled by rennin. In such solution, however, the casein is changed to paracasein, the paracaseinates of these bases being soluble. When paracasein is produced from casein by the action of rennin no other substance is formed. Two molecules of paracasein are produced from each molecule of casein as a result of this action. Rennin is not, strictly speaking, a coagulating ferment; the coagulation being a secondary effect, the result of a change in solubilities. Rennin action is probably a hydrolytic cleavage and may be considered the first step in the proteolysis of casein. It would follow from this that the action now attributed to rennin may be produced by any proteolytic enzyme.

65. **Carbohydrate Feeding and Muscle Creatin.**—The influence of carbohydrate feeding on the creatin content of rabbit muscle, Myers and Fine found, is similar to that observed in starvation, although after a long period of feeding there may be an even greater reduction in the creatin concentration. The decreased elimination of creatin after feeding carbohydrate is primarily dependent on the sparing action of carbohydrate on the muscle protein, or, in other words, is simply one phase of the sparing action of carbohydrate on protein metabolism.

71. **Effects of Pancreatic Extracts on Glycosuria.**—Intravenous infusion of pancreatic extract made from cow's pancreas by Knowlton and Starling's method raised the D:N ratio on the days immediately following, when the urine was collected in twenty-four-hour periods. When the urine was collected in short periods a similar extract produced a slight fall in the hourly dextrose elimination and in the D:N ratio in the hours immediately following injection. A mixed extract made in the same manner from dog's pancreas and duodenal mucosa produced a greater fall and in one instance complete disappearance of the urinary sugar. The fall, however, was followed in three to ten hours by a compensating increase. A similar quantity of Ringer's solution made alkaline to about the same degree as the medium for the extract, produced an effect on the glycosuria almost identical. A 2 per cent. Na_2CO_3 solution likewise caused a sharp decline in the excretion of sugar and a 2 per cent. HCl solution by stomach tube, produced a sharp increase. The increase in the one case continued for about the same length of time as the decrease of the medium on glycogenesis and glycogenolysis. It is possible also that the pancreatic extract affected the renal permeability. Neither extract of pancreas alone nor the double extract of pancreas and duodenal mucosa produced, within the time of maximal effect on the glycosuria, any effect on the respiratory quotient which could be interpreted as an index of increased combustion of carbohydrate. The total energy production of a depancreatized dog was found to be 42 per cent. greater than that of the same dog while normal. Transfusion of 200 grams of normal dog's blood likewise produced no observable effect on the R. Q. of a depancreatized dog. Murlin and Kramer conclude that neither the use of the Knowlton-Starling extract nor the transfusion of normal blood is yet a measure of any practical importance in restoring to the depancreatized dog the ability to burn sugar.

Journal of Cutaneous Diseases, New York

August, XXXI, No. 8, pp. 541-610

72 Presence of Spirochaeta Pallida in General Paralysis and Tabes Dorsalis. H. Noguchi, New York.
73 Luetin Test. F. Schmitter, U. S. Army.
74 Results of Salvarsan Therapy in Malignant Syphilis Praecox, Syphilid of Palms and Gumma of Tongue. H. F. L. Ziegel, New York.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

July, IV, No. 6, pp. 452-558

75 *Absorption and Excretion of Ammonia by Lungs. H. McGuigan, Chicago.
76 Some Examples of Effect of Asymmetric Nitrogen Atoms on Physiologic Activity. P. P. Laidlaw, Herne Hill, London.
77 Pharmacologic Action of Helenin, Active Principle of Helenium Autumnale. P. D. Lamson, Würzburg, Germany.
78 Study of Action of Various Diuretics in Uranium Nephritis, with Special Reference to Part Played by Anesthetic in Determining Efficiency of Diuretic. W. deB. MacNider, Chapel Hill, N. C.
79 Effect of Varying Tonicity on Anaphylactic and Other Reactions of Plain Muscle. H. H. Dale, Herne Hill, London.
80 Influence of Phenylquinolin Carbonic Acid (Atophan) on Uric Acid Elimination. O. Folin and H. Lyman, Boston.
81 *Action of So-Called Emmenagogue Oils on Isolated Uterine Strip. D. I. Macht, Baltimore.

75. **Absorption and Excretion of Ammonia.**—McGuigan claims that traces of ammonia are excreted, and probably absorbed, normally by the lungs. Ammonia and ammonium salts in stronger concentration are readily absorbed and excreted. Absorption is shown by stimulation of the respiration, spasmodic twitching of the muscles and by an increase in the ammonium content of the blood. Excretion is shown by an increase in the ammonium content of the fluid of the lungs.

81. **Action of Emmenagogue Oils.**—The following oils were studied by Macht: *oleum hedeomae* (pennyroyal), *oleum sabinae* (savine), *oleum tanaceti* (tansy), *oleum rutae* (rue), *oleum thymi* (thyme), *oleum terebinthinae* (turpentine), and apiol. Weak solutions or emulsions of these were made up with Locke's solution. Controls were also made with an emulsion of a neutral oil (olive oil). All of the substances used, even in small amounts, exhibited absolutely no stimulating action on the uterus. On the contrary they caused it to relax, and even paralyzed it. Pennyroyal, tansy and apiol were the most toxic of the group. The least deleterious of the oils was turpentine. It was necessary to use stronger emulsions of this drug to obtain the same effect. The paralytic action of the oils studied is exerted not only on the normal uterus, but also on one which is under the influence of a uterine stimulant.

Kansas Medical Society Journal, Kansas City

August, XIII, No. 8, pp. 305-344

82 Gall-Bladder. E. E. Hubbard, Shawnee.
83 Pseudoleukemia. R. H. Hertzler, Newton.
84 Office Treatment of Pelvic Diseases. J. T. Scott, St. John.
85 Relation of Puerperium to Present and Future Health of Woman. W. C. Bundrant, Partridge.

Kentucky Medical Journal, Bowling Green

August 15, XI, No. 16, pp. 689-744

86 Fallacy of Theory of Maternal Impressions. T. A. Frazer, Marion.
87 Pestiferous Fly. W. Blair, Columbia.
88 Diagnosis of Typhoid. W. M. J. Smiser, Skylight.
89 Difficult Labor. H. C. Clark, Falmouth.
90 Treatment of Uncinariasis. E. D. Burnett, Anchorage.
91 General Demeanor of Physician. D. G. Simmons, Adairville.

Michigan State Medical Society Journal, Grand Rapids

September, XII, No. 9, pp. 453-512

92 Operative Relief of Obstructive Hypertrophy of Prostate. P. M. Pilcher, Brooklyn.
93 Enterostomy and Enterotomy as Life-Saving Procedures. C. W. Barrett, Chicago.
94 *Method for Transfusion of Fresh Normal Blood. H. A. Freund, Detroit.
95 Anesthesia. J. B. Jackson, Kalamazoo.
96 Use of Pituitrin in Obstetrics. W. E. Welz, Detroit.

97 Emergency Abdominal Surgery in Practice of Country Practitioner. E. Sawbridge, Stephenson.
98 Syphilis and Salvarsan. R. J. Walker, Saugatuck.
99 Country Probationer. H. L. Simpson, Detroit..
100 Removal of Foreign Bodies from Eye; with Report of Three Cases. W. Haughey, Battle Creek.
101 Women Physicians of Michigan. F. A. Rutherford, Grand Rapids.

94. **Transfusion of Blood.**—The instrument designed by Freund consists of a well-fitting aspirating syringe, holding 20 c.c., a "two-way" stop-cock irrigator with a glass cylinder attached to this device, and two tubes with needles attached leading from each tube. The glass cylinder is fitted also with a small stop-cock. The whole is mounted on an inclined wooden base, which rests on the table. Into the glass cylinder is poured normal physiologic salt solution a little above body temperature. By opening the stop-cock of the cylinder and drawing out the plunger of the syringe, normal salt solution is taken into the syringe to about 5 c.c. The stop-cock is then closed. Both needles are then held vertically and normal saline washed through them until all air is removed from the rubber tubing and the needles. Four c.c. of normal salt solution still remains in the syringe. The larger needle is then inserted into the median basilic of the donor and fastened there with adhesive. The lever of the stop-cock is turned, permitting of suction to be made from the donor. This shuts off the saline that remains in the tube going to the recipient. Immediately suction is made on the tube in the vein of the recipient and the blood flows into the syringe. From the average vein 16 c.c. may be drawn into the syringe in less than half a minute. The syringe is revolved so as to thoroughly mix the blood and the saline.

As soon as the syringe is filled, a little of the mixture of the blood and saline is injected back into the donor, so as not to leave fresh blood without admixture of saline in the tube. The lever of the stop-cock is then turned toward the recipient, who first receives the saline remaining in the tube and then receives the entire injection of blood. At this point, for safety, if the experiment has not proceeded within the space of three minutes, it is well to wash both the donor's and the recipient's needles and tubes with a little saline solution, which may be obtained by opening the stop-cock from the cylinder and drawing salt solution into the syringe again. This may be done again and again until as much blood is injected as desired. Freund has employed this procedure successfully in seven cases up to the present time. From one individual, a polycythemic patient, he took blood, 160 c.c. in all, and injected into a pernicious anemic. Recently, blood was taken from the jugular vein of a normal rabbit and reinjected into one of the veins of the ear. In all, but 20 c.c. was taken. The purpose was to observe if any change occurred either in the heart or lung from the experiment. The animal was killed at the end of twenty-four hours, and the pathologic examination of the heart and lungs revealed no gross changes, such as might come from the injection of a small clot or particle into the lungs, giving rise to an infarct or pulmonary embolus.

Military Surgeon, Washington, D. C.

August, XXXIII, No. 2, pp. 101-199

102 Work of Medical Department of Ohio National Guard in Floods of 1913. C. Lynch, U. S. Army.
103 Two Turkish Hospitals. D. U. Carpenter, U. S. Navy.
104 Post Anesthetic Nausea. A. G. Wilde, U. S. Army.
105 Epidemic Meningitis and Meningo-Bacterin. S. H. Wadham, U. S. Army.
106 Specializing in Medical Corps with Special Reference to Obstetrics and Gynecology. S. M. DeLoffre, U. S. Army.
107 Heroin and Soldiers. R. M. Blanchard, U. S. Army.
108 National Guard and National Defense, with Special Reference to Sanitary Service. G. M. Blech, Chicago.
109 Medical Relief during Volcanic Eruption. N. Du Val Brecht, U. S. Army.

Ohio State Medical Journal, Columbus

August, IX, No. 8, pp. 367-402

110 Hemorrhages of Menopause and Cancer. A. Crotti, Columbus.
111 Forcible Correction (Abbott's Method) of Roto-Lateral Curvature of Spine (Scoliosis). W. G. Stern, Cleveland.
112 Value of Auscultatory Method for Determination of Blood-Pressure. W. E. R. Schottstaedt, Toledo

Ophthalmic Record, Chicago

August, XXII, No. 8, pp. 407-532

113 Unusual Types of Punctate Cataract. T. B. Holloway, Philadelphia.
114 Orbital Cellulitis Caused by Staphylococci. S. B. Muncaster, Washington, D. C.
115 Reflecting Book Marker for Teaching Readers how to Avoid Eye-Strain. J. N. Rhoads, Philadelphia.
116 Huge Orbital Osteoma. E. M. Blake, New Haven, Conn.
117 Sarcoma of Orbit Following Mules' Operation. D. Wood, Minneapolis, Minn.
118 Fixation Forceps. F. Allport, Chicago.
119 Early Sign of Paralysis of Facial Nerve. A. Rochester, Chicago.

Texas State Journal of Medicine, Fort Worth

August, IX, No. 4, pp. 123-146

120 Psychic Treatment of Nervous Disorders. E. Sandoz, Bern, Switzerland.
121 Pellagra. K. H. Beall, Fort Worth.
122 Pellagra as Public Health Problem. W. Shropshire, Yoakum.
123 Hookworm Problem: Synopsis of Work of Hookworm Commission of Texas State Board of Health. M. H. Boerner, Austin.
124 Symptoms and Diagnosis of Uncinariasis. O. H. Judkins, Plainview.
125 Some Needed Legislation in Regard to Control of Trachoma. N. B. Elles, Houston.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Annals of Tropical Medicine and Parasitology, Liverpool

August, VII, No. 3, pp. 339-356

1 Morphology of Trypanosome (T. Nigeriense, N.SP.) from Case of Sleeping Sickness from Eket, Southern Nigeria. J. W. S. Macfie.

Australasian Medical Gazette, Sydney

July 5, XXXIV, No. 1, pp. 1-19

2 *Unusual Cases of Hydatid Disease. H. M. O'Hara.
3 Case of Hydatidiform Degeneration of Chorion. W. Butement.
4 Case of Sarcoma of Iris. J. L. Gibson.
5 *Two Cases Simulating Appendicitis. E. S. Jackson.

July 12, No. 2, pp. 20-42

6 Adelaide Medical School. B. Poulton.
7 Series of Cases of Small-Pox. C. E. Corlette.
8 Dr. Mawson's Expedition to Antarctic. S. E. Jones.

July 19, No. 3, pp. 43-70

9 Urinary Diagnosis with Special Reference to Ureteral Catheterization. R. G. Craig.
10 Ureteral Catheterization in Obstetrics. S. H. Harris.
11 Case of Autogenous Streptococcal Septicemia. M. S. Yeech
12 Bacteriology of Calf Lymph, at Present Supplied for Vaccination in Sydney. H. Tebbutt.

July 26, No. 4, pp. 71-94

13 Case of Multiple Hernia, Obturator, Ischiatic and Femoral, in Adult. H. Rischbieth.
14 Rupture of Perineum C. E. Williams.
15 Case of Cholecystenterostomy for Obstruction of Common Bile Duct Due to Multiple Hydatid Disease. G. H. Abbott.
16 Bacteriology of Calf Lymph, at Present Supplied for Vaccination in Sydney. H. Tebbutt.

2. **Unusual Cases of Hydatid Disease.**—The cases cited by O'Hara are: 1. Hydatid at the back of the eye-ball. 2. Hydatid on the brain. 3. Hydatid of the left lung, implicating the pericardium. 4. Spontaneous fracture of the humerus caused by hydatid cyst in the shaft of that bone. 5. Hydatid in the jawbone simulating actinomycosis. 6. Hydatid in the apex of the right pleura simulating aneurysm of innominate artery. 7. Hydatid on the posterior surface of the liver pressing on the head of the pancreas, simulating disease of that gland. 8. Hydatid at the base of the lung, causing laryngitis. O'Hara finds that by means of the Roentgen rays it is now an easy matter to locate pulmonary hydatid cysts, the shadow outline shows so clearly in the lung tissue.

5. **Two Cases Simulating Appendicitis.**—In one of these cases Jackson found no appendix, no cecum and no ascending colon. The ileum appeared to end under the liver, where its junction with the colon was suspended to the upper part of the outer wall of the abdomen by a distinct ligament. From the point of this attachment the colon ran transversely across the abdomen in the usual situation, and was attached to the wall of the abdomen in a similar way to its commencement. Searching in the mesentery in the right hypochondrium for any remains of an appendix, he found two calcified glands; so hard

and angulated was one of them that one could believe easily that the pressure of a neighboring organ would cause considerable pain in that organ. He removed both glands. After the first forty-eight hours the patient was entirely freed from the pain that he had formerly complained of. The removal of the calcified glands seemed to have made that difference to him. Both cecum and appendix were found in the left side. To the inner side of the ascending colon was found the cause of the trouble—a coil of intestine nearly a foot long pushed through a hole (as it appeared) in the mesentery and under a broad band of peritoneal fold, so as to obstruct its circulation.

British Medical Journal, London

August 16, II, No. 2746, pp. 353-436

17 *Chemotherapy. P. Ehrlich.
18 *Heredity. W. Bateson
19 *Relationship between Medicine and Public Health. J. Burns.
20 *Necessity for More Thorough Control of Milk-Supply in Combating Surgical Tuberculosis in Childhood. H. J. Stiles.

17. **Chemotherapy.**—What is the exact nature of the problem the chemiotherapist sets out to solve when called in to prescribe for a man or an animal infected with some living parasite—protozoon, trypanosome, spirochete—visible or ultramicroscopic bacterium? The problem is, how to find a drug that will kill the parasites without hurting their host. To kill the parasites in test-tube experiments is easy, and can be done by any one of the many disinfectants and antiseptics in daily use. In the animal body, however, these disinfecting agents show a uniform tendency to attach themselves to and destroy the tissues of the host, leaving the infecting agent comparatively unharmed. To use Ehrlich's terminology, such drugs are organotropic and not parasitotropic. The chemotherapist has, therefore, to make and try a succession of synthetic compounds of such a chemical constitution as his experience shows him are likely to be parasitotropic in a high degree, organotropic as little as possible. Patience, skill, luck and—last, but not least—money—are the four chief factors on which his chances of success depend.

Chemical compounds can only act on the cells (whether the cell-bodies of parasites or the cells of the tissues that build up the human body) to which they are fixed; the only agent that can fix them is chemical affinity. Clearly, then, drugs will only be fixed by the cells that have a definite chemical affinity for them, or, in other words, have a definite chemical relationship to them. Mercury and arsenic are both metals highly poisonous to living protoplasm. But their salts will cease to be poisonous, however much mercury or arsenic they may contain, unless they have unsatisfied chemical affinities that enable them to combine with the living protoplasm, and so get to work on it. The atomic groups of the protoplasm that effect these chemical combinations with drugs are called "chemioreceptors" by Ehrlich; in the case of the drugs, the atomic groups that combine with the protoplasm are called "haptophores"; the atomic groups that exert the toxic action on the protoplasm are called "toxophores." To take the case of salvarsan, whose structural formula is set out by Ehrlich, the trivalent arsenic molecules are the toxophores, the orthoamidophenol groups are the haptophores; the rest of the molecule is therapeutically indifferent.

There are many obstacles in the chemiotherapists's path, and Ehrlich points out a few of them in the course of his address. To begin with, the difficulty of finding a synthetic drug that will kill the parasites without harming the host is enormous. Next, unless the parasites are all slain by a single injection at one fell swoop, the survivors may acquire a degree of immunity to the drug that will enable them and their progeny to live through subsequent injections. Again, the animal organism may contain dead corners, spots to which injected drugs have no means of access, such as the space which is filled by the cerebrospinal fluid; and parasites may be harbored safely there when they are killed throughout the rest of the body by the injection of some parasitotropic drug. A fourth difficulty may lie in this—that the patient unhappily chances to be supersensitive to the drug, by an idiosyncrasy that makes it far more toxic to him than it is to the ordinary individual. Ehrlich indicates the ways in which these and other difficulties are to be vanquished.

Chemiotherapy aims at the cure of infectious diseases by sterilizing the patient and killing the infecting agent in his tissues; what has been somewhat magniloquently termed a *Therapia sterilisans magna* — cure by sterilization on the large scale—is the objective. Should some of the parasites survive the first attempt at their destruction, the chemiotherapist falls back on a *Therapia sterilisans fractionata*, takes two or more bites at the cherry, and kills off the surviving parasites with a second or possibly more injections of his synthetic drug. Frambesia, or yaws, a tropical cutaneous complaint caused by a spirochete, is almost always cured by a single injection of salvarsan. Syphilis is now recognized to be less amenable to the treatment than this; and, though a satisfactory cure by one injection is claimed for a fair percentage of the cases, the syphilitic will generally have to take his sterilization by salvarsan in fractional or fractionated doses. In the human and animal diseases caused by protozoa and spirilla, speaking generally, the results obtained have been extraordinarily successful; Ehrlich believes that the whole host of bacterial infections will be driven into the corner by the chemiotherapist before many years have passed.

18. **Heredity.**—Bateson has examined human pedigrees, and the result of his search soon showed that many of the more definite hereditary diseases and malformations follow one or other of the systems with which Mendelian analysis has familiarized us. The first condition thus recognized to have a simple Mendelian inheritance was the peculiar malformation known as brachydactyly, described in America by Farabee. Another example is congenital cataract, studied by Nettleship. Both these conditions descend as dominants. It is characteristic of them that unaffected members of the families do not transmit. Not having in them the critical element which causes the condition, they cannot pass it on to their posterity. In the human examples the individuals affected are almost always heterozygous, and hence among the children which are born to their marriages with normal persons, we expect the affected and unaffected to be in equal numbers. In regard to the large group of diseases of nervous origin, such as Friedreich's disease, Thomsen's disease, and others, these sources of difficulty are especially serious; and from study of many genealogies Bateson has come to the conclusion that most of them are essentially dominants. Of recessive conditions in man we have less abundant evidence. Inasmuch as they usually appear from the unions of parents both apparently normal, though heterozygous for the condition, their occurrence is rare and sporadic.

The constant intermarriage of families in the valleys of Sweden, Norway and the Alps, Bateson found, gives the best opportunity for the study of this form of descent. Lately also, the American students of genetics have produced evidence making it clear that feeblemindedness has at least one of the marked features of a recessive condition. When both parents are feebleminded they have no normal children. It is nevertheless difficult to regard this condition as a simple recessive, for unions of the feebleminded with normal persons almost always produce some feebleminded children. Other conditions which exhibit a behavior characteristic of recessives are albinism, myoclonus epilepsy and alkaptonuria. They may all appear in the children of normal persons, with special frequency as the result of marriages of related parents, and there can be no reasonable doubt that these conditions are due to the loss of some factor present in normal persons.

Attention is called to a remarkable group of cases in which the appearance of abnormality may almost without doubt be regarded as partially dependent on the conditions to which the soma is subjected. Of these, Bateson mentions in particular some of the congenital abnormalities, such as hallux valgus; and some of the congenital deformities of the joints, as, for example, dislocation of the hip of the radius. In these cases, he says, we meet the curious fact that whereas the condition most usually appears in the offspring of the normal parents, it may, in certain families, be transmitted from parent to offspring as a dominant. The next group of cases is one in which the descent of the abnormality is limited wholly or partially by sex. Of these, the best known examples are those of the descent of color blindness, hemophilia, and one of the forms of nystagmus.

Referring to the descent of various forms of insanity, nothing has been made out with certainty with the exception of hereditary chorea, which behaves as a dominant, and the condition somewhat vaguely described as feeblemindness, which behaves as a recessive. The genetic analysis of insanity is at the present time practically impossible from the fact that the diagnosis of the various forms of insanity is by no means clear, and also from the fact that the conditions of life have obviously much to do with the development of such weaknesses.

19. **Medicine and Public Health.**—Burns takes up many topics: the saving of life; the doctrine that dirt makes disease; typhus fever; enteric fever; stages in registration of disease; the scientific period of disease prevention; Lister and surgery; Semmelweis and puerperal fever; factors in reduction of tuberculosis; a partial antidote to urbanization; alcoholism and disease; application of science in medical practice; the ever-increasing institutional treatment of disease; the work of the nurse, and national interdependence in relation to health.

20. An abstract of this paper appears in the report of the *International Medical Congress.*

Glasgow Medical Journal

August, LXXX, No. 2, pp. 81-159

21 Avoidance of Unsightly Scar Deformities in Operative Treatment of Cervical Lymphadenitis. J. H. Nicoll.
22 Vaccine Therapy in Treatment of Gonococcal Vulvovaginitis. W. R. Jack.
23 Congenital Occlusions of Esophagus and Lesser Bowel. G. H. Edgington.

Journal of Laryngology, Rhinology and Otology, London

August, XXVIII, No. 8, pp. 393-452

24 History of Rhinolaryngology in Great Britain. S. Thomson.
25 Foundations of British Otology. M. Yearsley.
26 Work Done in Britain on Diseases of Nasal Cavities and Their Accessory Sinuses. A. L. Turner and W. G. Porter.
27 Otolaryngological Societies of Great Britain and Ireland. D. Grant.
28 British Ear and Throat Clinics Historically Considered. R. Kershaw.
29 Clinics of Britain for Diseases of Throat, Nose and Ear. D. McKenzie.

Lancet, London

August 16, II, No. 4694, pp. 445-520

30 *Chemotherapeutics: Scientific Principles, Methods and Results. P. Ehrlich.
31 *Heredity. W. Bateson.
32 *Relationship between Medicine and Public Health. J. Burns.
33 Theories of Immunity and Anaphylaxis. A. Besredka.
34 Clinical Applications of Pathologic Chemistry. O. Folin.
35 Ophthalmic Progress in Egypt. A. F. MacCallan.
36 *Dosimetric Method of Administering Chloroform. D. W. Buxton.
37 *Infection of Urinary Tract in Children by Colon Bacillus. J. Thomson.

30, 31 and 32.—See the *British Medical Journal.*

36. **Dosimetric Method of Administering Chloroform.**—Since adopting the dosimetric method Buxton has seen fewer complications, and has been enabled to safeguard patients from chloroform collapse. The appearance of a patient after even a prolonged inhalation of chloroform, when a dosimetric method has been employed, is in striking contrast to what is seen when unstinted quantities of the drug have been inhaled. The one is of almost normal color and suffers few after-effects, while the other is pale, drawn, vomits and is collapsed to a greater or less degree. It is the difference between chloroform acting as an anesthetic and chloroform acting as a tissue poison—between anesthesia and toxemia. Buxton's experience is chiefly with the Vernon-Harcourt regulator. Its maximum is 2 per cent.; however, by using an increase tube, an undesirable addition according to Buxton, it is possible to produce 2.5 per cent. or, indeed, any percentage if the inhaler is specially graded for it. Buxton's experience, now extending over nearly ten years, has convinced him that, provided an accurate technic is practiced, 2 per cent. need not be exceeded. Very muscular and very obese subjects take a longer time to go under, and when time is an important matter, as in hospital work, a rapid induction with nitrous oxid and ether preceded by an injection of gr. 1/100 of atropin is often serviceable.

Buxton employs oxygen with the chloroform, not because the patient has any difficulty in breathing, or becomes cyanosed when this inhaler is in use, but because he is convinced that oxygen by maintaining the vigor of the tissues is a safeguard under any form of anesthesia. Oxygen also lessens shock and counteracts the tendency of the tissues to weep when large areas are incised or denuded of their covering. The failure to produce complete anesthesia with a 2 per cent. vapor is usually if not always the result of badly fitting masks or unskilled handling, so that although the machine registers 2 per cent. the actual percentage inhaled falls short of it. The use of a flanged mask lessens the danger of leakage. In some surgical operations deeper narcosis than the third degree— i. e., anesthesia—is called for by the surgeon. When this is so, Buxton finds the use of a dosimetric inhaler more than ever desirable, since the danger zone is entered, and the anesthetist requires a scientific instrument which enables him to control the higher percentage, increasing it at critical points in the operation and lowering it when these are passed. At all events, he knows exactly what percentage he is employing, and retains absolute control of the anesthetic.

It is alleged that dosimetric inhalers introduce an asphyxial element, and, further, that they are inapplicable for many types of operation. These statements, Buxton claims, arise from misapprehension or from lack of experience of the method. Cyanosis does not ever occur as a result of using an inhaler; when it arises it is due to preventable complications such as the faulty position of the patient, allowing fluid or other foreign material to occlude the airways or permitting the jaw to drop. Any of these possibilities may arise whatever method of giving chloroform is in use, and are so well known that any expert anesthetist will foresee and guard against them.

37. **Infection of Urinary Tract by Colon Bacillus.**—In ordinary acute cases, Thomson says, the first indication is always to ensure a free discharge of urine, usually by giving large quantities of fluid drink. If the patient refuses to drink enough, the fluid must be administered through a stomach-tube or by the rectum. The second indication is to see that the bowels move adequately. The best drug for this purpose is probably sodium phosphate, because it helps in the alkalinization of the urine. An occasional dose of calomel is also often beneficial. The other important forms of treatment are: (1) alkalinization of the urine; (2) administration of antiseptics; and (3) the use of serums and vaccines. The aim of the alkaline treatment is to render the urine alkaline, and to keep it so for a week or two after all the pus has disappeared and the signs of uneasiness have ceased. Although Thomson has generally used potassium citrate for this purpose he believes that other alkaline salts would probably prove equally efficacious if given in sufficient quantity. The dose of potassium citrate necessary varies considerably in different cases. The smallest amount which he has ever found successful in a severe case of colipyelitis was 24 gr. (1.55 gm.) in the day, in a girl aged 10 months. Generally one should begin with 60 gr. (3.88 gm.) if the patient is under 2 years old, and it will often be desirable to give double this amount. Occasionally 150 gr. (9.7 gm.) or 180 gr. (11.6 gm.) in the day has to be given before the urine becomes definitely alkaline and the temperature falls. Sometimes large doses set up diarrhea; and when this is the case the neutralizing effect on the urine is necessarily weakened. Occasionally the urine becomes alkaline within a day or two after beginning the treatment; generally in four or five days; rarely six or seven days, but never longer. The effect of the alkaline treatment is best estimated by studying the temperature charts; because, when the fever lessens, the other symptoms practically always improve.

The fact that great benefit follows the alkalinization of the urine in acute cases of *Bacillus coli* infection of the bladder, ureters and pelvis is quite established. How the treatment effects this, however, still requires investigation. Antiseptics given by the mouth may act beneficially in two ways. In the first place they may lessen the infected state of the urine by their bactericidal action in the alimentary canal. In many cases of pyuria from *Bacillus coli* infection a dose of calomel is followed by a distinct temporary improvement. The disinfectant action of the mercury in the intestine apparently improves the state of the urine by lessening the number of bacteria which are leaking into it from the bowel from time to time. Salol, in doses of 2 to 4 grains (0.13-0.26 gm.) three or four times a day, is certainly often helpful. Thomson has found it of most use when given in addition to alkaline treatment, especially in the later stages. Urinary antiseptics, such as hexamethylenamin and its various derivatives, which act directly on the bacteria by liberating formaldehyd in urine, have proved of great value in the treatment of urinary infection by the typhoid bacillus and certain other organisms. They are, however, disappointingly ineffectual in most cases of colon bacillus infection. With the serum treatment Thomson has had no experience. Vaccines he has used in a few cases, but with disappointing results.

Practitioner, London

August, XCI, No. 2, pp. 157-300

38 Points and Pitfalls in Gynecologic Diagnosis. J. B. Hellier.
39 *Treatment of Hematemesis: A Review. O. Grünbaum.
40 Three Cases of Kidney Tumor, with Discussion of Operative Treatment of Condition. J. S. Joly.
41 Polypi. V. H. W. Wingrave.
42 Septum Nasi and Its Abnormalities. F. Muecke.
43 Peri-Sinus Abscess as Complication to Acute Middle-Ear Suppuration. J. Harper.
44 Tropical Diseases. R. T. Hewlett.
45 Workmen's Compensation Act and Practitioner. C. Rowntree.
46 Erythema Nodosum A. H. Gosse.
47 Influence of Daily Habits in Causation of Alimentary Toxemia. R. Ackerley.
48 Sepsis in Medicine. J. R. Collins.
49 Nitrous Oxid-Oxygen Anesthesia in Major Surgery. H. P. Fairlie.
50 Influence of Pancreas and Extracts Thereof on Resistance to Infection. H. R. Harrower, Chicago.

39. **Treatment of Hematemesis.**—The ideal hemostatic in these cases in Grünbaum's opinion is epinephrin. He took the drug himself experimentally and found that his blood-pressure was not raised and no detrimental signs or symptoms made themselves evident. After this, large doses were administered to patients suffering from a variety of diseases and also to normal people, and it was found that only when there was adrenal insufficiency did the blood-pressure rise. This happened with such regularity that it occurred to H. D. Rolleston and himself that this rise might be used as a diagnostic sign of adrenal insufficiency. The drug was found to be an energetic vaso-constrictor, which, however, does not lead to general rise of blood-pressure when given by the mouth, but will act locally on the injured vessel through its nerve endings. In addition to this, it is not toxic when given by the mouth, nor does it destroy tissues, and, therefore, does not delay healing. It acts in very dilute solution. For these reasons its action approaches that of the ideal drug. It possesses one disadvantage, namely, it is followed by a reaction; there seems to be dilatation after its action is over. To meet this, small doses must be given at short intervals for a considerable period. Administration three or four times a day is useless; it must be given at short intervals, the longest being an hour, if the reaction is to be avoided and the full benefit of the drug attained.

If epinephrin solution, one part in a thousand, administered in dram doses along with grain doses of neutral calcium chlorid does not lead to the cessation of hemorrhage, further treatment must be considered; among these methods are the lowering of blood-pressure; the administration of normal horse-serum; surgical. Two minims of the tincture of aconite may be administered every half hour, until the heart beat becomes slower than sixty to the minute, or the pressure falls below 90 mm. Hg, or the heart becomes very irregular. In most cases the fall in pressure is rapid. The method of administration must depend on the condition of the patient. It is quite obvious that if the stomach is full of blood it would be futile to place two minims of tincture of aconite in it; on the other hand, hypodermic injection of aconite is very painful, because it stimulates the sensory nerves before it paralyzes them. In any case, tincture could not be used hypodermically, but a dilute solution of aconitin in slightly alkaline normal saline. Occasionally, the tincture of aconite may be added to the saline enemas.

As for horse-serum, Grünbaum claims that the rationale of its action in arresting hemorrhage and healing a gastric ulcer is not satisfying. Physiologic, as well as physical, rest should be aimed at. For the first three or four days, the stomach should be kept empty, and water supplied to the patient in the form of saline rectal enemas. Even the introduction of water into the rectum may lead to a certain amount of movement of the intestine, and possibly of the stomach, but it does not, as far as is known, cause any secretion of hydrochloric acid in the stomach. Water given by the mouth may lead to secretion of hydrochloric acid by the gastric mucosa, and this would tend to dissolve the clot which is acting as a stopper for the ulcerated vessel. Later, when food is given, it should contain alkali and proteid to combine with any acid secreted. Grünbaum is convinced that nutrient enemas in certain cases in which food cannot be given by the mouth for a very considerable time may supply a certain amount of energy.

This is an outline of the treatment of hematemesis when due to acute gastric ulcer. If there is a history of previous attacks of hematemesis, and there is little doubt that it is a chronic ulcer, Grünbaum says the advisability of operation must be considered. It must be remembered that, in all probability, operation will have to be resorted to in the end, and the increased risk of carrying out the operation when the patient has lost blood, and possibly the mouth is in a condition in which operation is not especially favorable, has to be balanced against the risk of the patient dying from hemorrhage. It is not possible to lay down any definite rule; every case has to be considered in detail.

When the hemorrhage is due to some of the other causes, such as duodenal ulcer, the greater part, if not all, of the blood is passed by the bowel. The treatment is in many respects similar to that of gastric ulcer. In malignant ulceration of the stomach, the treatment should be similar to that of chronic ulcer. In cases of hemorrhage due to cirrhosis of the liver, surgical treatment is of no avail, and the administration of hemostatics is useless. An attempt may be made to lower the general blood-pressure, and to increase the coagulability of the blood. Dilatation of the blood-vessels of the liver is indicated, but whether that is brought about by counter irritation of the hepatic region, by means of mustard plasters and the like, is doubtful. The treatment of rupture of an aneurysm into the stomach or esophagues is beyond the medical man. Rupture of an esophageal vein simulates gastric ulcer and is usually diagnosed at operation or post mortem.

Annales de l'Institut Pasteur, Paris

June, XXVII, No. 6, pp. 421-500

51 Trypanosomes and Leukocytozoon Found in Birds in the Congo. J. Kerandel.
52 Research on the Aspergillus Niger. (L'amygdalase et l'amygdalinase chez l'A. niger et quelques hyphomycètes voisins.) M. Javillier and H. Tchernoroutsky. (Changements morphologiques de l'A. niger en présence de divers acides et sels acides.) A. Kiesel.
52 The Persian Miana Bug and Spirochetes. (Argas et spirochètes. Granules de Leishman.) E. Marchoux and L. Couvy.
54 Gummatous Tumors in New-Born Infant with Numerous Spirochetes. C. Sauvage and L. Géry.

Revue de Chirurgie, Paris

August, XXXIII, No. 8, pp. 173-344

55 *Old Fracture of the Patella. (Revue sur le traitement des fractures anciennes de la rotule.) E. Quénu and J. Gatellier.
56 *Operative Treatment of Pulmonary Tuberculosis. P. Gorse and A. Dupuich.
57 Operative Treatment of Chronic Splenomegaly with Cirrhosis of the Liver and Ascites. (Splénomégalies chroniques splénothrombosiques.) I. Tansini and G. Morone.

55. **Old Fracture of the Patella.**—The details of seventy-eight out of 134 cases are tabulated for comparison of the outcome of different operative procedures in treatment of old fracture of the patella. Even before 1893 the ultimate results were very encouraging, good functional outcome being reported in 72.4 per cent. and 5.2 per cent. with partial use of the joint. Since that date the outcome has been much better, fully 80 per cent. having an extremely satisfactory use of the limb and fairly good in 17 per cent. of the others. Of all the methods that have been applied, the autoplastic technic, utilizing the quadriceps muscle itself, has proved most effectual. Ferraresi described it in 1902; the Murphy, Rotter and Turner technics are practically the same.

56. **Operative Treatment of Pulmonary Tuberculosis.**—Freund's chondrotomy seems to have been abandoned as no reports of its application have been published since 1910. Resection of ribs to mobilize the chest wall is generally regarded as the last operative resort when conditions prevent artificial pneumothorax. The details of 301 cases of the latter are tabulated, with recovery in forty-seven and great improvement in seventy-two. A complete failure was realized in only twenty-five; the procedure can be incriminated for the death of three patients, and thirty-one died from the progress of the disease.

Beiträge zur klinischen Chirurgie, Tübingen

July, LXXXV, No. 2, pp. 239-520

58 *Clinical and Experimental Study of Acute Necrosis of the Pancreas. H. Seidel.
59 Fat for Filling Cavities in Bones. (Zur Plombierung von Knochenhöhlen mit frei transplantiertem Fett.) M. Krabbel.
60 *Tests of Functional Capacity of the Kidneys. (Zur funktionellen Nierendiagnostik.) R. Bromberg.
61 Cancer of the Ethmoid Bone. (Endothelium des Siebbeins.) W. Jerchel.
62 Operative Treatment of Flat-Foot. (Resultate der Ernst Müller'schen Plattfussoperation.) E. Müller.
63 Influence of Operations on the Bones of the Foot on the Later Growth and Functioning of the Foot. O. Hahn.
64 *Relations between Chronic Inflammation and Ulceration in the Stomach and Gastric Cancer. (Beziehungen der chronischen Gastritis mit ihren Folgezuständen und des chronischen Magenulcus zur Entwicklung des Magenkrebses.) G. S. Konjetzny.

58. **Acute Hemorrhagic Necrosis of the Pancreas.**—Seidel devotes 161 pages to a detailed description of his ten clinical cases and extensive experiments on several dozens of dogs, comparing his results with those of others and adding four pages of bibliographic references. The trouble seems to be the result of activation of the trypsin ferment inside the gland. This activation occurs by way of the pancreatic duct from the action of bacteria or bile or both together, or of enterokinase or of trypsin already activated in the duodenum. Exceptionally, the activation may be the work of bacteria arriving by way of the blood or lymph, or there may be embolism and thrombosis. But under all circumstances, the direct causal agent is the activated trypsin, its action on the parenchyma causing the changes typical of acute necrosis of the pancreas.

60. **Tests of Functional Capacity of the Kidneys.**—Bromberg thinks that the electric conductibility of the urine from each kidney gives the most reliable information in regard to the functional capacity of each, and he gives an illustrated description of the apparatus which he has devised for testing the electric conductibility and commends as simple and accurate. He gives a few examples in which a number of the usual tests were applied and the findings compared. Many of them conflicted with each other but the course of the cases in all confirmed the findings of the electric tests.

64. **Relation between Chronic Inflammation and Ulceration of the Stomach and Gastric Cancer.**—Konjetzny gives an illustrated account of a case of multiple multicentric cancer devoloping in the stomach on a basis of chronic inflammation and polyps. In another case the stomach contained several cancer foci, this multicentric carcinosis having evidently developed on an adenomatous polypous hyperplasia of the mucosa, the transitional phases being apparent at many points. Other cases showing cancerous degeneration of a chronic hard ulcer are illustrated also, while in other cases a secondary ulcer had developed in a stomach already the seat of malignant disease. Without careful microscopic examination it may often be impossible to say whether the ulcer or the cancer is secondary in such cases. In any event, the data presented emphasize anew the extreme importance of inflammatory conditions in the stomach mucosa for the development of gastric cancer. Most dangerous apparently in this respect is the polypous proliferation of the mucosa resulting from chronic gastritis. He thinks that about 10 per cent. of gastric cancers probably develop from an ulcer.

Beiträge zur Klinik der Tuberkulose, Würzburg

XXVII, No. 3, pp. 291-318. Last indexed Aug. 16, p. 516

65 *Premenstrual Rise in Temperature. (Ueber prämenstruelle Temperatursteigerungen.) T. B. Hansen.
66 *Indications for Compressive Treatment of the Lung or Exercising It. (Wann Ruhigstellung der Lungen, wann Bewegung?) E. Kuhn.
67 Relative Value of Living and Dead Tubercle Bacilli and of Their Endotoxins in Solution in Active Immunization against Tuberculosis. K. v. Ruck (Asheville, N. C.).
68 Tuberculin Treatment of Tuberculosis. (Zur Tuberkulinfrage.) G. Schröder.
69 Importance of Bovine Tubercle Bacilli for Tuberculosis in Children. (Zur Frage der Bedeutung der Perlsuchtbazillen für die Tuberkulose des Kindes.) H. Deist.

65. **The Menstrual Temperature Curve.**—Hansen reports extensive research to determine the fluctuations in temperature connected with menstruation and pregnancy. He gives three 5-page charts to show the typical temperature curves. Before puberty and after the menopause the temperature runs on a constant level, as in men, with very slight fluctuations, but menstruation brings a temperature wave rising high just before the menses and falling below normal afterward, beginning to rise again about two weeks before the date of the following menstruation. The premenstrual rise in temperature starts to decline one or two days before the onset of the menses. The type in all the women was alike. Hansen compares his findings with those of others and emphasizes their importance. Conditions are liable to mislead in the estimation of the temperature in disease unless the physiologic fluctuations in the temperature are known and allowance made for them. He theorizes to explain the causes for the fluctuations, attributing to exaggeration of metabolism of albumin the rise of temperature observed. It occurs under conditions requiring an increase in the vital processes, as in pregnancy and lactation. One special point which he emphasizes is that during the first third of pregnancy, the temperature is of the high premenstrual type; it falls later and is more of the postmenstrual subnormal type during the last half of pregnancy, with no monthly periodical fluctuations. Another point is that during periods of increased metabolism the interval of metabolic rest—from midnight to early morning—is abbreviated, so that the temperature at 6 a. m., for example, is as high as considerably later in the day under other conditions. And yet the minimal temperature may have persisted the same.

66. **When Should the Lungs be Treated by Compression and When by Exercise?**—Kuhn reiterates that with pulmonary tuberculosis the lung should either be kept entirely at rest or kept actively movable. Any half-way state between active movement and complete collapse is not only irrational but actually promotes the proliferation of the tubercle bacilli. The lung should either be squeezed tight or it should be exercised and trained to the utmost possible expanding power. There is no middle ground between these extremes. The induced pneumothorax answers the first indication when conditions permit. He defines the indications for compression as extensive processes, especially those with a cavity, in all those cases in which the temperature cannot be kept normal under repose or slight exercise. This applies even in the less advanced cases in which bed rest and respiratory exercises send the temperature up a little or it rises spontaneously on slight exercise even after prolonged repose. On the other hand, the active exercise treatment of the lungs is indicated

in all the (not too advanced) cases which do not show permanent fever and in which under cautious breathing exercises the chest can be mobilized and enlarged while the temperature keeps persistently at normal. The exercise treatment is contra-indicated with all acute inflammatory processes, especially large cavities, and in all cases with persisting fever, even in the earliest stages. By far the best means to mobilize, exercise and train the lung, he says, is with the aspiration mask. This permits graduated exercises, carefully adapted to the condition at the time, and it also permits auto-inoculation, to use Wright's expression for forcing into the circulation toxins from the focus in the lungs. With the aspiration mask this is done in a rational manner, he says, under constant control. Freund's chondrotomy, dividing the costal cartilage to mobilize the chest wall, does this in a sudden violent way, entailing traction on the parts, including the focus, and it is thus more or less dangerous. Kuhn gives a number of illustrations to show the symmetrical enlargement of the chest and expansion of the lung under systematic exercises with the aspiration mask. (It was described in The Journal, 1913, LX, 632 and 768.)

He gives microscopic findings which show that in the collapsed lung the larger blood-vessels are still filled with blood, especially the bronchial arteries, thus supplying nourishment for the lungs and permitting the bactericidal action of the blood on the bacilli. The lymph supply is shut off more completely, and hence auto-inoculation is rendered impossible. He thinks that the exercising of the lung with the aspiration mask, or similar valve device to impede the intake of air, has a decided influence in prophylaxis by increasing the vital capacity. He knows of instances in which the mask has been used by young people for years, off and on, and the shape of the chest and its excursions have been favorably modified to an astonishing extent.

Berliner klinische Wochenschrift

August 4, L, No. 31, pp. 1421-1464

70 *Splenomegaly. (Fall von Splenomegalie.) F. Kraus.
71 *Cardiovascular Symptoms and Their Treatment in Diabetic Coma and the Stage Preceding. R. Ehrmann.
72 Experimental Transmission of Tumor Cells. (Experimentelle Uebertragung von Geschwulstzellen.) F. W. Strauch.
73 *Treatment of the Severest Forms of Ataxia in Tabes. Frenkel (Heiden).
74 Roentgenotherapy of Bone and Joint Tuberculosis. (Zur Anwendung des Röntgenlichtes bei der Knochen- und Gelenktuberkulose.) E. A. Oppenheim.
75 Heliotherapy of Tuberculosis. (Zur Sonnen- und Luftbehandlung der chirurgischen Tuberkulose.) P. Glaessner. (Heliotherapie der Tuberkulose in der Grossstadt.) L. Alkan.
76 Urine Test for Cancer. (Ueber die klinische Bedeutung der Bestimmung des Kolloidalstickstoffes im Harn nach der Methode von Salkowski und Kojo zur Diagnostizierung des Carcinoms der inneren Organe.) W. P. Semenow.
77 Simple Quantitative Test for Albumin in Urine. (Quantitative Eiweissbestimmungen im Urin für den praktischen Arzt.) M. Claudius.
78 Origin of Amniotic Fluid. (Herkunft des Amnioswassers.) B. Wolff.

70. **Splenomegaly.**—Kraus' patient was a Russian merchant of 62 who for three months had suffered from headache and pains in the limbs, gastric disturbances, anemia, somnolency and depression, and subfebrile temperature; cardiac dyspnea gradually developed, with anasarca at times, and the spleen increased in size until the longest diameter was about 43 cm. The blood findings were those of an aleukemic myeloid leukemia, with suggestion of pernicious anemia, the total leukocytes not above normal, but the number of myelocytes markedly increased, as also of the young forms of the polymorphonuclear cells, while the polymorphonuclears were reduced in numbers. The patient came to Kraus to have his spleen taken out, but Kraus regards splenectomy as very dangerous in leukemia, and he applied merely radiotherapy and benzol. The patient has improved notably under this treatment and the spleen measures now only 30 cm. A peculiar finding in this case was the discovery of cells in the blood which had every appearance of being endothelial cells. Plesch and Lippmann found similar endothelial cells in the pleural effusion of animals rendered experimentally aleukocytic.

Kraus reiterates in conclusion that myeloid leukemia (*Myelose*) can develop either acute or chronic; with mixed cells or myeloblasts; with or without anemia; with increased numbers of the white cells (numerically leukemic) or with subnormal numbers of white cells (aleukemic), and as a diffuse or more isolated affection of the bone marrow, or splenomegaly. There is no longer any excuse for confusing the splenomegaly of leukemia with the splenomegaly of Banti's disease. The latter is benefited by splenectomy but it is directly dangerous in the bone-marrow disease; death has followed in some instances.

71. **Importance of Cardiovascular Symptoms in Diabetic Coma and Its Preceding Stage.**—Ehrmann calls attention anew to his recent statements that diabetic coma is long preceded by a characteristic drop in the blood-pressure due to the toxic action on the cardiovascular system of the beta-oxybutyric acid and the acetic acid. The patient dies in the coma not from sudden heart failure, but from the cumulative toxic action of the butyric acids. He further presents evidence to prove that the beneficial effect of large doses of an alkali in diabetic coma is not due to saturation of the acids but to the fact that the elimination of the toxic acids is materially promoted by the alkali. The ferric chlorid urine test may be negative even in incipient coma, but after administration of the alkali the reaction becomes positive. The patient is in greater danger, the less the response to the ferric chlorid test applied to the urine.

Long before the coma develops, the toxic action of the butyric acids can be detected by watching over the cardiovascular system and, if it shows signs of weakness, coma can be warded off by keeping it up to par with the proper drugs. He insists that just as sodium bicarbonate must be pushed until the urine becomes alkaline or, rather, until the ferric chlorid test elicits the most intensive response, the tonics for the cardiovascular system must be pushed in the same way. He gives the details of eleven cases in which by keeping the cardiovascular system under control he was able to avert impending coma by subcutaneous injection of camphor or caffein or some preparation of digitalis by the mouth. One patient has been in this stage of precoma for two years. This is a man of 42 and he frequently had what Ehrmann calls the "precoma expression," resembling the sleepy phase which follows after an epileptic seizure. The blood-pressure was 140 or 150 mm. After a few months there was a slight attack of coma; then the respiration became deep and slow, twenty to the minute; the eyeballs were soft; the blood-pressure only 100. Subcutaneous injection of camphor tided the patient past the danger point, and full earning capacity was soon restored although he still occasionally has periods of deep costal breathing.

In cases of permanently low blood-pressure, Ehrmann has given caffein sodiobenzoate, 7:200, in daily doses of from three to six tablespoonfuls over long periods without any unfavorable action on the stomach. He prefers this preparation of caffein to the sodiosalicylate, as it does not affect the ferric chlorid test in the urine, like the salicylate. He also advises such patients to drink strong coffee or tea daily. Caffein has further a stimulating effect on the diuresis, independently of the blood-pressure. Together with the caffein, or alone, digitalis may be needed. After the coma has once developed, measures to act on the cardiovascular system may come too late.

73. **Treatment of the Severest Forms of Ataxia in Tabes.**—Frenkel here gives the principles of his method of reeducating the muscles in locomotor ataxia, with the modifications for individual cases. (The Journal has recently summarized some discussions of this principle of analytic compensatory exercises in reeducation of the motor system, as, for example, 1913, LX, 252, 634 and 927.) Frenkel insists that with uncomplicated tabes complete success depends merely on whether the patient is able to devote the necessary time to the course of exercises. With even a small amount of muscle sensibility, the patient can learn to walk in the exercise room with his eyes shut. But this may take a year or longer; even at the best, weeks must pass before the patient has learned

to take the first independent step. The dangerous atony of the bladder and intestine is checked by the exercises keeping the abdominal musculature in healthy action. Severe catarrhal affections of the bladder are extremely rare in patients taking the exercises. The great trouble is the length of the course required. The expense in a private sanatorium is often prohibitive, and public institutions are more to relieve acute sickness. The finest results Frenkel has ever witnessed from the exercises in the severer forms of ataxia were at the Salpêtrière at Paris, which is, to a certain extent, an institution for incurables. A person once admitted to this department cannot be discharged against his will. Frenkel knew of one patient who had been completely cured of the severest form of locomotor ataxia and could walk independently and climb into an omnibus, but he refused to leave and he also refused to do any work in the institution. In Germany the sick benefit societies refuse to pay for such courses for their policy-holders, probably because of the failure of courses as given in the public hospitals, owing to the lack of trained skill or to the shortness of the period of training. Frenkel adds that there are no contra-indications to the exercise treatment properly applied, but he warns explicitly against combining this treatment with a course of baths. Balneotherapy with or following the exercises frequently leads to slight paresis of the muscles of the legs which in a few weeks may develop into total paralysis.

Deutsche medizinische Wochenschrift, Berlin

July 31, XXXIX, No. 31, pp. 1489-1528

79 *Subphrenic Abscess. G. Ledderhose.
80 Pathologic Importance for the Eye of the Tissue Juices. (Die Bedeutung des Anaphylatoxins und des art- und körpereigenen Gewebesaftes für die Pathologie, speziell die des Auges.) H. Dold and A. Rados.
81 Venous Pulse and the Heart Sounds. (*Venenpuls und Herztöne.*) R. Ohm.
82 Comparison of Axilla and Rectum Temperature after Long March. A. Lippmann.
83 *Diagnosis of Incipient Apical Tuberculosis. G. Richter.
84 Tetany with Perforation-Peritonitis. A. Holterdorf.
85 *Perineal Suppuration in a Typhoid-Bacillus Carrier. L. Levy.
86 Pseudomyxomatous Cysts in Appendix. C. *Hammesfahr.*
87 Diffuse Adenomatous Polyposis. G. Scagliosi.
88 Fascia Flaps. (Experimentelle Untersuchungen zur freien Faszientransplantation.) B. Valentin.
89 Treatment of Rachitis with Cod-Liver Oil, Lime and Phosphorus on Basis of Metabolic Findings. (Zur Behandlung der Rachitis mit Lebertran, Kalk und *Phosphor* auf Grund von Stoffwechselversuchen.) E. Schloss.
90 Roentgenotherapy of Superficial Lesions. (Moderne Röntgentherapie mit bes. Berücksichtigung der Oberflächentherapie.) F. M. Meyer.

79. **Subphrenic Abscess.**—Ledderhose says that a just preceding appendicitis or liver trouble may give the clue when there are no local subjective or objective signs of the abscess, but merely that the general condition does not improve as rapidly as anticipated and fever drags along after the primary affection is supposedly conquered. Only rarely is the subphrenic abscess ushered in with a chill, high fever and pain. In the subacute cases there may be pain in the intercostal spaces or below the costal arch; the side involved does not share in the breathing excursions as much as usual. Percussion reveals a zone of relative dulness which in front has a cupola-like outline. The liver seems to be pushed down, the heart up. Accumulation of gas in the region is revealed by resonance between the lung and liver, changing its location as the patient changes position. Roentgenoscopy shows the diaphragm abnormally high, and reveals accumulation of gas, but if the pleura is involved the roentgenoscopic findings may be misleading. If exploratory puncture brings pus, the indications for operative treatment are given at once. By introducing and withdrawing the cannula very slowly, there is less danger of missing the abscess; it may be necessary to puncture at several points before the pus is discovered. He is confident that if the space just below the diaphragm is examined more as a routine measure, the findings will clear up many puzzling cases and permit effectual treatment. He reports several cases from his own *experience in which* the subphrenic abscess developed after operative treatment of perforation of a gastric or duodenal ulcer. In the majority of cases the appendix was the *primary seat of* trouble. In differentiating subphrenic abscess, empyema, pyopneumothorax, pulmonary and liver abscess and liver echinococcus cyst are the affections which have to be excluded.

83. **Diagnosis of Incipient Apical Tuberculosis.**—Richter complains that general practitioners as a rule fail to utilize to the utmost the progress which recent years have brought in the diagnosis of apical processes. He cites Pel's remark that certain physicians percuss and auscultate apical tuberculosis in nearly every patient that comes their way, and, what is worse, give them treatment to correspond. Richter deplores in particular the neglect of the aid possible with Krönig's method of extremely light percussion over the apices, outlining with a pencil the findings for comparison. Percussion is generally applied too hard. The *finger or* plessimeter should just rest on the skin, not press on it. This is especially *important* in percussing toward the side. Fixation of the free margin of the lung, not only of the lower margin, may be the earliest sign of a tuberculous process in the lung. Krönig has often found this lack of movability of the free margins as the earliest sign confirming the suspicion of tuberculosis suggested by *the general condition.* The induration of the apex which develops in consequence *of impeded* breathing through the nose is not yet fully understood and differentiated by general practitioners, as a rule; far too often it is erroneously assumed to be a tuberculous process. Richter describes a typical example of this "collapse induration of the apex"; a man of 25, a great smoker, had had part of the turbinate bones resected six years before, but the mucosa was still so hypertrophied that the lumen was almost closed on one side. During the winter he had *had a* protracted bronchitis and then mild influenza with slight fever. Examination after recovery showed infiltration with catarrh of the right apex and there was a little sputum each morning, but the man felt entirely well and the sputum contained no tubercle bacilli. The appetite was good, the pulse normal, and there was no loss in weight but the resonance of the right apex was impaired and the Krönig field of resonance restricted. The margins of the lungs were movable below on both sides. Auscultation showed a little rough vesicular breathing at the right apex with scanty dry murmurs, but the temperature was constantly normal and the breathing pure. If the physician had not known of the old history of impeded nasal breathing in this case, the diagnosis of apical tuberculosis would have been almost certain.

An unusually low, enlarged thyroid may cast a misleading shadow, and Richter emphasizes the necessity for study of the finished roentgenogram instead of trusting merely to the screen. Kreuzfeld's cough phenomenon, namely, the *lightening up* of the shadow of the apex as the individual coughs, which occurs constantly in health, is conspicuously absent in case of a tuberculous process in the apex. This finding alone, Richter thinks, justifies the necessity for the use of the Roentgen rays in differentiation of dubious pulmonary processes.

85. **Typhoid Bacilli Carriers.**—Levy *discusses* the case of a miner who had typhoid at the age of 15 and has been under observation for the last seven years as a chronic "carrier," constantly discharging typhoid bacilli in the urine. Last year an abscess developed in the perineal region which contained typhoid bacilli in pure culture. Of the forty-one bacilli carriers in the Metz region known to the authorities during the last ten years, two were the source of infection of others in five separate years; four in four years; ten in three years; nine in one year and only thirteen had escaped *infecting* others. The miner whose case is reported had caused infection of others in five out of the seven years he had been a carrier, and two others in four out of seven years. The danger of infection of others increases as the carrier lives and works with larger numbers of persons and in places where sanitary conditions are more rudimentary. Carriers with access to water-closets and accustomed to cleanly habits are far less dangerous than miners and others living in unhygienic environments. If the employers are informed that the *man* is a dangerous carrier, this means merely that they will dismiss him and he will seek work where he is not known, keeping

secret his bacilli-scattering propensity. The only solution for the problem of these unhygienic chronic bacilli carriers, Levy thinks, is to provide some means for their work and support with as little infringement on their liberty as possible, but still making it impossible for them to infect others. As the dangerous scatterers are mostly working people, the question of their maintenance would not be very serious if only some small fund for the purpose was available. By providing for the hygienic welfare of the carriers, the harvest of disease and death they are now sowing will die out from lack of seed.

Medizinische Klinik, Berlin

August 3, IX, No. 31, pp. 1233-1276

91 *Alcohol in Infectious Diseases. C. A. Ewald.
92 *Diuresis. L. Hess.
93 Chondroma in Shoulder-Joint Capsule. (Gelenkkapselchondrom des Schultergelenks.) R. Hagemann.
94 Mineral Waters in Treatment of Habitual Constipation. M. Rheinboldt.
95 Direct Medication, etc., of the Duodenum. (Ueber Duodenaltherapie. F. Rosenberger.
96 *Eucalyptus Oil in Scarlet Fever and Measles. (Zur Eucalyptusfrage bei Scharlach und Masern.) J. Elgart.
97 Action of Mercury and Salvarsan on the Circulation of the Blood in the Isolated Pancreas of the Rabbit. (Quecksilber und Salvarsan in ihrer Wirkung auf die Blutströmung nach mikroskopischen Beobachtungen am lebenden Tier.) G. Ricker and R. Foelsche.

91. **Alcohol in Infectious Diseases.**—Ewald is not a teetotaler yet he has dropped the use of alcohol almost entirely in his medical service and practice, regarding it as absolutely useless in acute and chronic infectious diseases from the standpoint of reducing the temperature or destroying the bacteria or as a hypnotic. Alcohol does not increase the resisting power of the blood but rather reduces it; habitual users of alcohol are attacked by infectious disease just as often and just as severely as those who do not use alcohol, and they ove less resistant than the latter. The use of alcohol as a od is futile in a single dose, and the continued use is directly harmful. As a stomachic, alcohol can be entirely dispensed with; much better results can be obtained from hydrochloric acid and pepsin in proper doses or infusions of condurango, etc. In chronic tuberculosis, egg-nogs and alcoholic drinks breed gastric catarrh and reduce the patient's power of digestion and assimilation instead of promoting it. In severe collapse, toxic or mechanical or from loss of blood, the stimulating effect of alcohol may prove useful, especially as alcohol is practically always accessible in convenient form, but the success of the "temperance hospitals," where not a drop of alcohol is allowed, shows that camphor, strychnin, caffein, etc., in fact answer the purpose equally well if not better. He cites some experimental research and statistics, including some from a large Leipsic sick benefit society which show that pneumonia occurred ten times as often among hard drinkers as among the other policy-holders and was fatal in a like proportion. Articular rheumatism and other infectious diseases occurred nearly twice as often; and some English statistics show nearly twice as many cancers among drinkers as among the non-drinkers. At the same time, Ewald thinks that a judicious use of alcohol to give flavor to a meal is sometimes advisable, particularly in chronic diseases, the benefit from the appetizing, stimulating influence outweighing the deleterious consequences. But even here, he warns, the use of alcohol in this way should *not* be allowed to become a habit but should be only occasionally permitted.

92. **Diuresis.** — Hess discusses the functional relations between the kidneys and other organs which are much more numerous and important than was ever surmised until comparatively lately. It is easy to detect a tendency to dropsy long before there is any edema if we make a practice of weighing every week our patients known to have impaired heart or kidneys. An increased weight indicates retention of water and by keeping the patient in bed a few days the weight drops by several pounds as profuse diuresis sets in. Widal had a patient who had retention of water in this way without edema to a total of 13.2 pounds. The tolerance for retained water varies within wide limits during this antedropsy stage. The diuretics of the purin series, including caffein, act by enlarging the renal artery and thus promoting the blood-supply to the kidney, while at the same time reabsorption of water in the tubules is reduced. It is not necessary to give the drugs in large doses; small doses answer the purpose still better, suspending the drug occasionally for a day or two. The effect is greatest in the parenchymatous and tubular form of kidney disease and least when the vascular part of the kidney is involved. The effect of the diuretic depends naturally on the heart's being functionally capable; stimulation of the heart action may induce diuresis without further measures. Digitalis has a direct diuretic action from its effect on the renal arteries, even in doses far too small to act on the heart itself. The heart tonics and the diuretics may be combined, but there should be ample intervals to avoid fatiguing the diseased epithelium. Abnormally high arterial pressure may be due to contraction of the peripheral vessels alone, or the contraction may affect mainly the splanchnic vessels, the toxic contraction being the result of accumulation of acids. In this "high pressure stasis," a heart tonic, alone or in combination with caffein, may induce profuse diuresis as the heart action improves.

Restriction of salt is useful only when the kidney is unable to eliminate the salt, but restriction of fluids may be beneficial when either the heart or kidney or both are involved in producing the tendency to dropsy. Von Noorden keeps the average intake of fluids down to 1,500 or 2,000 c.c. a day in chronic nephritis, only at rare intervals permitting the patient to drink more copiously. The advantage of thus reducing the work of the heart is obvious, especially in prophylaxis of dropsy. Hess does not keep kidney patients on a milk diet as he regards this as undernourishment, while the milk contains too much salt. Only when the patients with edema are particularly robust, well nourished or corpulent, he follows the Karell diet. The best results with this are attained in the cases in which the dropsy is due to a combination of kidney trouble with arteriosclerotic and myocarditic processes. Karell allows the patient nothing but 200 c.c. of boiled milk four times a day for five or seven days, at 8, 12, 4 and 8, keeping him in bed all the time. Then he allows also one egg a day, at 10 a. m., and later a little zwieback, returning to the ordinary diet the twelfth day after commencing the course, but not allowing more than 800 c.c. of fluid a day for two or four weeks. By the third day there is generally abundant diuresis and great subjective relief without the use of drugs. Drugs afterward also are much more effectual.

96. **Prophylaxis and Treatment of Scarlet Fever and Measles.**—Elgart has been applying eucalyptus oil according to Milne's directions in prophylaxis of scarlet fever and measles. But he did not smear the whole body with it, as Milne does, but had the children wear a bag kept soaked with the oil, thus inhaling the fumes constantly and disseminating the fumes through the room. Milne is house physician at the Barnado homes for boys, and during his thirty years of service over 12,000 boy inmates have passed through his hands. There were 245 cases of scarlet fever and 234 of measles, all imported from without and none starting an epidemic although the children were not isolated but merely smeared from head to heel with the eucalyptus oil twice a day for the first four days and then once a day for six days, while the tonsils were swabbed with 10 per cent. phenol in oil, at first every two hours the first day and then at longer intervals. The swab used was always the size of the patient's thumb. Elgart prefers inhalation of a 30 or 50 per cent. solution of lime (Aq. calcis) to sterilize the throat, instead of the phenol, and has found it equally effective, but he makes a point of having every one coming in contact with the patients or exposed to infection in any way use the inhalations also, and likewise wear the eucalyptus oil amulets. In one ward with seven children, one developed scarlet fever and was isolated; the other children for four weeks were made to inhale the 50 per cent. solution of lime twice a day at first and later once a day and wear the eucalyptus oil bags and none developed scarlet fever. He remarks that the development of the scarlet fever in a child who had been in the (new) hospital for four weeks suggests that ordinary sore

throat cocci may have acquired exceptional virulence for some reason and thus set up the scarlet fever. Milne's technic is based on the assumption that the eucalyptus oil sterilizes the desquamating skin, but Elgart thinks that this is unnecessary if only the receptive organs of the persons liable to become infected are kept sterilized, and he thinks that this is accomplished by keeping the air of the room saturated with the fumes of the eucalyptus oil on the neck bags, supplemented by direct sterilization of the throat, keeping up these measures for six weeks.

His experience confirms further that the eucalyptus oil neck bags are effectual also in prophylaxis of measles; no further cases developed in a ward with eighteen children after two coming down with measles had been isolated and the others kept supplied with the oil amulets. The isolation was maintained only while the bronchitis lasted, about two weeks. Scarcely any of his scarlet fever patients inhaling the solution of lime systematically developed complications, and they were extremely mild and brief. He is convinced that his success sustains his assumption that the acute infectious diseases are spread by inhalation, and that by keeping the inhaling organs of all exposed constantly sterilized with the eucalyptus fumes, the lime water or other effectual disinfectant, the spread of the infection can be prevented, the disease attenuated and the course shortened.

Münchener medizinische Wochenschrift

August 5, LX, No. 31, pp. 1697-1752

98 Technic for Radiotherapy of Cancer. (Karzinombestrahlung.) E. Bumm and H. Voigts.
99 *Hypertrophy of the Prostate. (Wandlungen in der Lehre der Prostatahypertrophie.) Kielleuthner.
100 Sources of Error in Serodiagnosis: Influence of Blood Content of an Organ. (Zur Kenntnis der Fehlerquellen des Dialysierverfahrens bei serologischen Untersuchungen.) E. Abderhalden and A. Weil.
101 Combined Treatment of Inoperable Uterine Cancer. (Beeinflussung des inoperablen Uteruskarzinomes mit Strahlen- und intravenöser Chemotherapie.) R. Klotz.
102 Improved Tecnnic for Gastrostomy. (Eine neue Gastrostomiemethode.) H. H. Janeway (New York).
103 Malformation of Male Genitals. (Einige interessante Missbildungen der männlichen Generationsorgane.) A. Ansprenger.
104 *Metastatic Eruptions in Infectious Diseases. (Beitrag zur Kenntnis der Pyämide.) Werther.
105 *Tuberculin Treatment for Outpatients. Hartmann.
106 *Death after Salvarsan. (Ein merkwürdiger Todesfall nach Salvarsan. J. Krol.
107 *Protection for the Hands in Septic Operations. (Einfacher Handschutz bei eitrigen Operationen.) A. Brüning.

99. Changes in the Conception and Treatment of Enlarged Prostate.—The illustration given of a transverse section of the pelvis with an enlarged prostate, photographed from a frozen section without retouching, supplements the illustrations given in The Journal July 6, 1912, page 8, confirming anew that the prostate proper does not share in the hypertrophy. Kielleuthner reiterates that the prostate proper is squeezed flat and thus forms a sort of capsule around the enlarged adenomatous mass, so that the latter can be shelled out without injury to the prostate proper or the genital organs. This explains why the genital functioning is not affected by the "prostatectomy" if it is done from above, merely lifting out the adenomatous mass and leaving all the parts and organs below intact. Suprapubic prostatectomy is thus a conservative operation as it leaves the prostate, while it is radical as it removes all that is causing trouble and leaves no chance for recurrence He comments particularly on the great advantage of being able to estimate the functional capacity of the kidneys before the operation, saying that for this we have a number of means at our command, the best, perhaps, being the sulphonephthalein test. This is particularly convenient and reliable as it does not depend on subjective impressions as much as other tests.

He reduces the danger of the operation by doing it at two sittings, first making the opening into the bladder and waiting for the astonishing improvement which almost invariably follows when a free outlet for the urine is thus provided. The operation on the prostate then becomes practically free from danger. Recent reports show that the mortality from prostatectomy has dropped from 22 to 10, 8 or 4 per cent. When the adenomatous mass has been shelled out, Freyer prevents bleeding by flushing the region with very hot salt solution; the same effect can be realized with an ice-cold solution. Severe hemorrhage is combatted by tamponing, packing the entire bladder with gauze if need be. General anesthesia should be avoided when possible; with much debility Kielleuthner employs only regional anesthesia with direct anesthetization of the mucosa. He gets the patient up the third or fourth day.

104. Pyemids.—Werther uses Merk's term for the metastatic skin affections which develop in the course of infectious diseases. The pyemids range from mere erythema to pustules, ulcers and necrotic processes. He reviews the literature on the subject and reports four cases all of one type, a hemorrhagic erythema affecting mostly the face and fingers. In one case the pyemia dated from an abortion a year before; in the second case from a septic sore throat first noted nine weeks before. In the third case there was double infection, with tubercle bacilli and the *Streptococcus viridans*. The fourth patient was the only one that recovered; the dermatitis in this case was evidently connected with nephritis, bronchitis and a sinusitis, and it subsided after the sinus had been evacuated; healing was delayed by intercurrent erysipelas. The whole sickness lasted six months. These four patients were women between 18 and 41. In another case the exanthem followed a streptococcus sore throat and involved the whole body; during life the cocci could be cultivated from the blood. In another case the erythema resembled chronic erysipelas; it developed after twelve weeks of nephritis, bronchitis and myocarditis with high intermittent fever. The patient succumbed to suppurative meningitis. The whole trouble probably originated in an old ulceration found in the knee at necropsy. Besides the persisting erysipelatous affection, there were numerous acutely developing small spots and purpura with streptococcus emboli.

105. Tuberculin Treatment of Dispensary Patients.—Hartmann has been much impressed with the good results obtained with minute doses of tuberculin at the tuberculosis dispensary in his charge. He makes the injection between the shoulder blades, starting with 0.000005 c.c., and has the patient go home and stay in bed for the rest of the day, and if there is fever until the temperature is normal. The excellent results are particularly striking, he says, as the patients are poor and their surroundings are often far from favorable for recovery from their tuberculosis.

106. Death after Salvarsan.—Krol's case differs from the usual type of post-salvarsan fatalities. There was no evidence of hemorrhagic encephalitis and no sign of trouble for two weeks. No mercury had been taken at any time. The patient was a tabetic man of 59 with six healthy children. The salvarsan was given mainly to relieve the severe pains in the limbs, which it promptly did each time. As the pains were relieved by the salvarsan and as it seemed to keep the tabes stationary and as the patient pleaded for the injections, he was given seven intravenous injections of the salvarsan in the course of two years. Two weeks after the last injection extensive necrosis developed in the left rectus muscle and the man succumbed in coma in three days. The interval since the last preceding injection was over a year. The dose was 0.6/200 c.c.

107. Protection of the Hands.—Brüning has found that smearing the hands with petrolatum, after they have been scrubbed, rinsed in alcohol and dried, will protect against germs. The microbes are caught in the petrolatum and when the hands are washed in hot water the germs are washed off with it. He uses petrolatum medicated with boric acid, and states that extensive tests have confirmed the efficacy of this simple protection which he regards as a more certain protection than rubber gloves, as gloves are so liable to tear.

Therapie der Gegenwart, Berlin

August, LIV, No. 8, pp. 337-384

108 *Treatment of Syphilis. (Wann müssen wir Syphilitiker behandeln?) H. Schottmüller.

109 Treatment of Stomach Disease. (Fortschritte in der Behandlung der Magenkrankheiten.) G. Klemperer. Commenced in No. 7.

110 *Exophthalmic Goiter. (Diagnostische und therapeutische Bemerkungen zur Basedowschen Krankheit.) J. Hallervorden. Commenced in No. 7.

108. **Treatment of Syphilis.**—Schottmüller comments on the prevalence of syphilis, citing the experience of a number of German clinicians; in his own internal disease service at Hamburg 18.6 per cent. of 1,014 hospital patients were syphilitics, and 40 per cent. of all his patients with heart disease. Oberndorfer found signs of syphilitic disease of the aorta in 7 per cent. of all the cadavers he has examined (Munich). Deneke encountered 200 cases of aortitis in four years, and a syphilitic origin was unmistakable in 80 per cent. of the total. Lenz estimates that 10 per cent. of all the men in the large cities have syphilis. He found syphilitic aortitis in 52 per cent. of all his syphilitic male patients over 30, and Stadler has reported a still higher proportion, 82 per cent.

According to the general experience, Schottmüller says, the really dangerous period, as far as the vascular system is concerned, is the second decade after infection. Aortitis may develop in three or four years but as a rule it does not become manifest until ten years or more have elapsed. It may retrogress; Oberndorfer has encountered instances of apparently healed aortitis in syphilitics, but they are the rare exceptions, and the shriveling that results from the healing process is liable to entail serious clinical consequences as the process generally is located at the aortic valves and at the openings of the coronary arteries into the aorta. In Schottmüller's twenty-two patients, 1908-1910, the course of the aortitis was unfavorable and often fulminating, notwithstanding energetic treatment was systematically applied. Nearly all the persons with syphilitic aortitis die within one or two years after it begins to induce symptoms. But there is a long latent stage and it is during this stage that treatment must be applied to have any efficacy.

It is here, he says, in the early detection of syphilitic vascular trouble, that the Wassermann test has proved of preeminent importance. The reaction was positive in 86 per cent. of fifty-three cases of syphilitic aortitis in his service, even in the earliest stages of the vascular disease; the only negative responses were in syphilitics who had just been taking a vigorous course of treatment. He remarks that even if the progress of science enables us to abort or cure syphilis in its incipient stages, yet there will always be cases in which the infection was not recognized in its early phase, and no treatment was applied; Fournier states that fully 50 per cent. of his patients with syphilis had never been aware that they had the disease. The detection of late syphilis and its treatment will therefore always remain a task for the general practitioner, and it is to him that the infected will look to protect them against the dangers of syphilitic vascular disease and general paresis. Even the most approved and vigorous courses of treatment do not always protect against them later in life, which shows that our present methods of treating syphilis are far from perfect.

The practical conclusion Schottmüller draws from these and other arguments presented are that every person known to have syphilis should be kept under supervision and especially during the second decade should be tested with the Wassermann technic regularly two or three times every year. If the patient does not apply voluntarily to his family physician for the test each time, he must be summoned. The persons with occult syphilis, that is, who are not aware that they have ever had the disease, can be detected only when family physicians and consultants apply the Wassermann test regularly and indiscriminately as a routine measure to all. He remarks that it is simply amazing to note the frequency of positive responses when this is done indiscriminately, especially in life insurance examinations.

When a positive reaction is obtained, specific treatment should be started at once and be kept up until the test gives a negative response. When the test persists positive in spite of all our efforts, the patient can be reassured that the dangers of the tardy phase may be averted although the treatment may have failed to transform the last symptom, namely, the specific response to the biologic test. Treatment with a positive response should be along the general lines for treatment as in the secondary stage. He warns further that clinical symptoms may occur even with a negative reaction, and consequently that examination of the organs should never be neglected. The same principles of frequent repetition of the Wassermann test and treatment based on its findings should be applied when there is suspicion of an inherited syphilitic taint. He has thus obtained excellent results in a number of children of syphilitic parents; they showed no signs of syphilis, beyond the positive reaction, but specific treatment was at once applied and the children have grown up healthy. The easiest way to obtain the forty drops of blood for the test is by drawing the blood from the tip of the finger directly into the centrifuge tube.

110. **Exophthalmic Goiter.**—Hallervorden reviews his experience with 100 cases of exophthalmic goiter. He regards it as a disease of an essentially protracted course; the acute exacerbations seem to be independent morbid entities, but this is not true in fact. They are merely the flaring up into an acute phase of a long dragging affection. The acute phase subsides but leaves usually some symptoms which show the initiated that the disease has merely entered on another stage of latency. It may be roused up anew or for the first time by the mere administration of iodin or by an intercurrent infectious disease; this occurred in thirteen of his hundred cases; by a curetting or extraction of a tooth; by a course of treatment for tapeworm; by a fright or the death of some close relative (eleven cases); by prolonged worry (eighteen cases), and by overwork (ten cases). In only twenty cases the disease progressively developed to the acute phase without some known exciting cause. In no less than twenty-five cases in his experience administration of iodid was, beyond question, responsible for the onset of the acute phase. Periods of physiologic stress, such as puberty, the menopause and pregnancy, afford a special predisposition. In one of his cases the exophthalmic goiter came on apparently for the first time with the first menstruation. The symptoms were so severe that operative treatment was applied with apparently a complete cure. No further symptoms were noted until the woman reached the menopause, when the trouble flared up anew. In ten of Hallervorden's patients the first signs of the disease appeared during the menopause, and in four other cases the long latent affection flared up anew at this period. On account of the frequent nervous symptoms with exophthalmic goiter, psychotherapy should be given a prominent place in treatment. In addition to complete repose, if possible out of doors, the main reliance should be on hydrotherapy, packs and half baths, as advocated by Winternitz. The pulse generally subsided during the packs. Cooling applications were also found useful for the neck and back every day an hour at a time and a coil of tubing to apply cold to the heart when the heart showed much disturbance. Galvanization of the sympathetic nerve never did any good in his experience, nor antithyroid treatment, but arsenic medication never failed. Out of seventy-five patients treated on these principles, fifty-three were materially improved and the improvement has persisted in many for from four to eight years to date. An operation was advised in the others but some refused it and in some of the others even the operation failed to restore the balance between the glands with an internal secretion, so that the improvement did not amount to much. This group includes those with predominantly nervous phenomena and a particularly insidious course, the type which Stern calls "basedowoid." The symptoms in this form of the disease generally prove refractory to both internal and operative measures; there is usually some psychopathic element in this group. A few typical examples are described; in one case the tremor, insomnia, headache and palpitations were very pronounced but there were no sweats, no diarrhea and no appreciable changes in the neck or eyes. Partial thyroidectomy was followed by rather an aggravation of the above symptoms, and fleeting edema developed. In conclusion he

remarks that the cases with a sudden onset with the fully developed syndrome seem to be the most amenable to surgical measures, while the incomplete forms—probably because these come only late to the surgeon—offer little prospect of relief from an operation. The prospects are not much better with internal treatment, he adds. Real permanent benefit from any treatment may be anticipated only when the disease is not of long standing.

Wiener klinische Wochenschrift, Vienna

July 31, XXVI, No. 31, pp. 1265-1296

111 Estimation of Diaphragm Functioning. (Zur Frage der Bestimmung des Zwerchfellstandes und der Zwerchfellfunktion.) C. Byloff.
112 Sarcoma of Uterus Wall. (Zur Kasuistik der Wandsarkome des Uterus.) H. Zacherl.
113 Intra-Uterine Miliary Tuberculosis. H. Rollett.
114 Intralobar Pulsating Empyema. E. Levi.
115 Ethyl Chlorid in Dentistry. (Der Chloräthylrausch in der operativen Zahnheilkunde.) A. Kneucker.
116 Trained Nurses. (Die Fürsorgeschwester im Frieden und im Kriege.) I. v. Arlt and L. Moll.

Zeitschrift für Geburtshülfe und Gynäkologie, Stuttgart

LXXIII, No. 3, pp. 631-986. Last indexed Aug. 23, p. 631

117 Extrachorial Development of the Fetus; Three Cases. J. Samuels.
118 Intraperitoneal Ventrofixation of Round Ligaments; One Hundred Cases. P. Rissmann.
119 Buried Fine Silk Sutures in Alexander-Adams Operation; Hundred Cases. P. Rissmann.
120 *The Wandering Spleen in Its Relation to the Genital Organs. (Die Wandermilz in ihren Beziehungen zur Geburtshülfe und Gynäkologie.) F. Montuoro.
121 Prognostic Significance of Streptococci in the Intra-Partum Vaginal Secretions. M. Goldstrom.
122 Primary Carcinoma in the Vagina and Leukoplakia. E. Lohnberg.
123 Study of the Electric Excitability During Pregnancy. (Die elektrische Erregbarkeit bei Schwangeren.) H. Thierry.
124 The Lipoids in the Human Uterus. K. Sugi.
125 External Female Pseudohermaphrodite. O. Küstner.
126 Obstetric Importance of Early Rupture of the Membranes. (Bedeutung des frühzeitigen Blasensprunges für Geburt und Wochenbett.) P. C. T. v. d. Hoeven.
127 Febrile Abortion. W. Benthin.

120. **Wandering Spleen in Relation to Gynecology and Obstetrics.**—Montuoro has found records of seventy-nine cases of torsion of a wandering spleen to which he adds one from his own experience, all in women. He knows of only three cases in men. In thirteen cases the spleen was removed during a pregnancy or after delivery, and all the women recovered but one who died the sixth day. On the other hand, four of the thirteen women died who required splenectomy for rupture or other injury of the spleen during a pregnancy. The greatest damage from a wandering spleen occurs when it is in direct contact with the genital organs and adhesions develop or it pushes them out of place. The pregnant uterus may compress a wandering spleen and evil result, while splenectomy during a pregnancy has a very good prognosis. The diagnosis of torsion of a wandering spleen is much facilitated if one only bears the possibility of such a lesion in mind when examining a tumor in the genital sphere.

Zeitschrift für klinische Medizin, Berlin

LXXVIII, Nos. 1-2, pp. 1-204. Last indexed July 19, p. 232

128 *Clinical Diagnosis of Primary, Secondary and Syphilitic Degenerative Disease of the Kidneys. F. Munk.
129 *Pathology of Sweat-Gland Functioning. (Anhidrosis und Diabetes Insipidus.) H. Gunther.
130 Behavior of Organic and Inorganic Bromids in the Animal Body. A. Gutknecht.
131 The Blood-Findings of Chronic Myeloid Leukemia in a Case of Subacute Miliary Tuberculosis. O. Roth.
132 The Capillary Blood-Pressure. (Zur Frage des Kapillardruckes. Klinische Untersuchungen mit dem Basterschen Ochrometer.) R. Landerer.
133 Nature of the Glandular-Filamentous Substance of the Red Blood-Corpuscle and Its Relation to the Staining Properties. W. Pfuhl.
134 Stipple Red Cells in the Bone-Marrow. (Der experimentelle Nachweis basophilpunktierter roter Blutzellen im Knochenmark.) G. Walterhöfer.
135 *Research on Chronic Pancreatitis and Chronic Jaundice. R. Ehrmann and H. Kruspe.
136 Arrest of the Respiration During Deep Inspiration. (Der Atemstillstand in tiefer Inspirationsstellung.) E. Mosler.
137 Changes in the Antibody Content of Rabbit Serums. R. Ledermann and E. Herzfeld.
138 The Pathologic Physiology of Athletics. A. Albu.
139 Degeneration of Nuclei of Leukocytes and Lymphocytes. H. Kronberger.

128. **Degenerative Changes in the Kidneys.**—Munk calls attention to the hitherto unsuspected frequency of degenerative changes in the kidneys as modifying the clinical picture. Examination of the urine sediment will suggest the possibility of this: Fat drops and fatty casts in the urine are a sign of fatty degeneration of organs in various forms of cachexia, anemia and diabetes, and are thus important for the prognosis. They may also suggest amyloid degeneration as in severe tuberculosis. Droplets of fat may also indicate the degree of destruction of kidney parenchyma in an acute nephritis. Highly refractile lipoids in the urine sediment, as examined with the polarization microscope, are a reliable sign of some chronic degenerative affection of the kidney and may differentiate such from an acute nephritis. Highly refractile *(Doppeltbrechende)* lipoids are found in secondary contracted kidney consecutive to acute inflammatory nephritis. Also in primary degenerative large white kidney. Also in relatively small amounts in amyloid kidney accompanied by numbers of isotropic fatty casts. Also, although very rarely, in true and arteriosclerotic contracted kidney. Acute parenchymatous syphilitic nephritis is a type of the pure lipoid-degenerative nephrosis, the large white kidney. The article is illustrated.

129. **Anhidrosis and Diabetes Insipidus.**—The man of 32 in the case reported never perspired and when the weather was very hot suffered severely from symptoms showing lack of the normal regulation and radiation of heat. Diabetes insipidus had also developed and an affection of the skin best described as a miliary angiomatosis.

135. **Chronic Pancreatitis.**—Ehrmann and Kruspe here report a second case in which their diagnosis of chronic pancreatitis was confirmed by the findings at operation. In both the cases the gall-bladder was found sound and the jaundice observed must have been due to compression of the bile duct by the swollen head of the pancreas. They reiterate that examination of the stools is indispensable for the diagnosis of chronic pancreatitis; meat and fat are passed undigested and the patient loses weight rapidly on account of the defective utilization of the nourishment ingested. Pressure on the duodenum may cause retention in the stomach. In one of the cases described this occurred in addition to the jaundice from pressure on the bile duct. One of the patients had colic pains in the upper abdomen; the other never had pain. With stasis in the pancreas the diastatic ferment is absorbed and appears in the urine while the diastatic and tryptic ferments disappear from the stools. The metabolic findings in the two cases are given in detail and also in a case of chronic occlusion of the bile duct but no pancreatitis. The cholecystenterotomy answered the desired purpose in each case. It is important after the operation to regulate the diet to permit only foods which do not require the pancreatic ferments for their digestion and assimilation, thus avoiding meat and fat and partaking abundantly of starchy foods, with possibly the addition of some animal pancreas preparation or vegetable ferment.

Zeitschrift für Urologie, Berlin

August, VII, No. 8, pp. 615-704

140 *Atrophy of the Prostate; Four Cases. V. Caesar.
141 *Improved Technic for Direct Inspection of the Ureters. (Ein neues Ureterenkystoskop mit Vorrichtung zum leichten Auswechseln der Katheter, zugleich ein Beitrag zur Asepsis des Harnleiterkatheterismus.) J. Vogel.
142 Case of Acute Retention of Urine with Imperforate Hymen in Girl of 15; Secondary Fatal Peritonitis. (Fall von akuter Harnretention bei Gynatresie.) H. Lohnstein.
143 *Multiple Myoma of the Penis. F. Stavianicek.
144 Serious After-Hemorrhage Following Electric Obliteration of Papilloma in the Bladder. (Fall von starker Nachblutung nach Operation eines Blasenpapilloms mittelst Hochfrequenzströmen.) C. Schneider.

140. **Atrophy of the Prostate.**—Caesar reports three operative cases of atrophy of the prostate and the post-mortem findings in a fourth case, the patient a tabetic. In this case

the prostate had actually shriveled entirely away; there was merely a thin pocket-like fold of mucosa, lying like a valve over the outlet of the bladder. The bladder was much dilated and the walls atrophied and thin. In two of the four cases there was a history of gonorrhea; in the others the origin of the trouble was obscure but there had *evidently been a phase* of inflammation at some time. In one case the operation put an end to all trouble; in the others great improvement followed, so that his experience confirms the advantages of operative relief. Casper has stated that there is no residual urine with atrophy of the prostate, mentioning this as an aid in differentiation, but in Caesar's cases this did not apply, there was up to 1,200 c.c. in one, 1,000 in another and 600 c.c. in the third. Differentiation is difficult; it is important to examine the patient as he stands and again in the lithotomy and again in the knee-elbow position, as the palpation findings are so misleading. When practicable he advises to palpate over a hard catheter, or, with both hands, through the rectum and abdomen simultaneously. It is astonishing, he remarks, how folds of mucosa in the chronically inflamed bladder will simulate an enlarged lateral prostate lobe. He endorses Barth's suggestion that during every operation on the prostate careful search should be made for evidence as to the share of gonorrhea in indurative prostatitis and the share of the latter in atrophy of the prostate in later life.

141. **Catheterization of the Ureters.**—Vogel mentions among other suggestions for improved technic that he has found very useful a long linen bag, about 2 cm. wide, in which he keeps the catheter and sterilizes the whole together. The bag is longer than the catheter and the open end projects beyond the tip of the catheter and is tied around with a tape. When the catheter is to be introduced into the cystoscope the tape is untied, the catheter pushed through into the passage in the cystoscope, the bag still covering the exposed part and held tight on it by a spring clip through which the catheter can be pushed farther in without trouble. By this means all direct handling of the catheter itself is avoided.

143. **Multiple Myoma of the Penis.**—A radical operation was done as the diagnosis of cancer seemed certain on account of the extent of the process. But the trouble proved to be merely a benign collection of myomas scattered through the organ and a less mutilating operation might have answered the purpose. If a scrap had been excised beforehand for microscopic examination. a less mutilating operation might have been done.

Gazzetta degli Ospedali e delle Cliniche, Milan

August 12, XXXIV, No. 96, pp. 999-1006

145 Autoserötherapy in Pleurisy with Effusion. (Le iniezioni di autosiero ed i leucociti nelle pleuriti essudative.) N. Barbaro.

Policlinico, Rome

August 10, XX, No. 32, pp. 1141-1176

146 Persistence of Typhoid Bacilli in the Stools after Recovery from Typhoid. (Osservazioni sulla permanenza del B. del tifo nelle deiezioni di convalescenti e guariti di infezione tifica.) C. Campiglio.

147 *Recurrence of Gastric Ulcer Soon After Gastro-Enterostomy; Four Cases. (Sui resultati della terapia chirurgica dell' ulcera dello stomaco.) P. Filadoro.

147. **Recurrence after Gastro-Enterostomy for Gastric Ulcer.**—One of the four patients whose cases are described succumbed to *peritonitis from* the recurring ulcer. One refused a second operation. In the third the new opening was found entirely obstructed, and in the fourth adhesions interfered with the functioning of the new opening and there were no further symptoms for a time after the adhesions had been broken up. But the cure even in this case was not permanent.

Riforma Medica, Naples

August 2, XXIX, No. 31, pp. 841-868

148 The Meningeal Reactions in Chronic Lead-Poisoning. P. Boveri.

149 Trypanosomes in the Peripheral Blood. (Sul reperto del parassita di Leishman nel sangue periferico.) S. Cannata.

150 Compound Dislocation of Finger or Toe; Three Cases. (Su tre casi di lussazione complicata.) A. Albaique.

Nordiskt medicinskt Arkiv, Stockholm

XLV, Medical Section No. 4. Last indexed June 7, p. 1844

151 Action and Two Types of Elimination of Iodin in the Body (Studier öfver jodverkan.) C. J. Enebuske. Commenced in No. 3.

7$8 *Action of Salvarsan on the Kidneys. (Salvarsanets inverkan på njurarna vid intravenösa injektioner.) H. I. Schlasberg.

153 Malaria and Causes of Its Almost Complete Extinction in Sweden. C. Flensburg.

154 *Injurious Effect on the Heart of Competitive Athletics. (Die chronischen Anstrengungsveränderungen des Herzens.) R. Beck (Vienna).

152. **Injurious Action of Salvarsan on the Kidneys.**—Schlasberg summarizes twenty-seven cases in which administration of salvarsan was *followed* by the appearance of tube-casts in the urine, showing that the arsenic eliminated through the kidneys after intravenous injection of the salvarsan caused irritation on its way through these organs. He examined the urine of eighty patients systematically. In *most cases the tube-casts* were manifest in the urine the day after the intravenous injection; only in a few instances not until a day later. Reexamination two months later showed no signs of tube-casts. When mercury was being given with the salvarsan, the urine contained more tube-casts than otherwise. Experiments on nine rabbits confirmed this deleterious action of salvarsan on the kidneys; it affects principally the epithelium of the convoluted tubules. There is liable to be albuminuria at the same time; this subsides sooner than the tube-casts.

154. **Danger to the Heart in Competitive Athletics.**—Beck insists that all forms of extreme physical effort, all competitive sporting events, rowing, running, swimming, bicycling, etc., for prizes are injurious for the heart. They should be unconditionally done away with as they wreak destruction on the heart of the young. Rationally managed sports, on the other hand, are a great blessing and benefit for our generation.

Norsk Magazin for Lægevidenskaben, Christiania

August, LXXIV, No. 8, pp. 1025-1160

155 Research on Pathogenic Fungi; Especially the Actinomyces. (Strallesoppen fra Toten—Straalesoppens opholdssted og mugfrugt.) O. Sopp.

156 *Primary Actinomycosis of the Skin. W. Holland.

157 Scarlet Fever without Exanthem or Desquamation. O. Lorange.

158 Heredity and Psychiatry. J. Henrichs.

159 Spontaneous Fracture of the Scapula. (Et tilfælde av spontanfraktur av skulderbladet.) N. B. Grøndahl.

160 Fracture of Vertebrae in Ski Jumping. (Kompressionsfraktur av hvirvelsøilen ved skilopning. N. B. Grøndahl.

156. **Primary Actinomycosis of the Skin.**—Holland adds a third to the two cases previously published in Norway of primary invasion of the skin by the actinomyces. His patient was a man of 62, boarded out in the country as a mildly insane ward of the state. He was physically healthy until a superficial process developed on the chest and gradually spread, the man dying of debility the eighth month. Microscopic findings were negative at first, and guinea-pigs inoculated showed no signs of disease. This excluded tuberculosis, and the assumption of actinomycosis was later *confirmed* by the microscope and again at necropsy. The peculiar odor of the pus, a pungent nauseating odor, was characteristic, as also the tenacious gluey consistency of the discharge from the abscesses. No cattle in the neighborhood were known to have been sick for a long time. Perhaps the most peculiar feature of *actinomycotic* lesions is the lack of involvement or invasion of the lymph vessels and nodes. There are no phenomena on the part of the lymphatic system, no enlarged nodes in the vicinity, and no spreading through the lymphatics even when the infection has lasted a long time. Holland has examined the records of over a thousand cases of actinomycosis and found forty-five in which the actinomycosis developed in direct connection with some injury or at the site of an injury. Comparison of these cases shows that the lesion is of pronounced local character and that the incubation may be only a few days in length. In some cases there was an interval of only eight days; the longest interval in this material was six weeks.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

Vol. LXI, No. 12 Chicago, Illinois September 20, 1913

THE ADDED RESPONSIBILITY OF THE SURGEON WHEN CALLED ON TO TREAT SURGICAL LESIONS IN THEIR EARLIER STAGES*

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The easier the diagnosis the worse the prognosis. This statement hardly needs further comment or illustration. It is especially true in malignant disease. When the surgeon is able to recognize cancer by its clinical appearance the relative prognosis is bad. Complete operations in this stage yielded 30 per cent. or less of permanent cures.

When the malignant disease cannot be recognized clinically because of its early stage, but is diagnosed at the exploratory incision by its gross appearance, with or without the aid of a frozen section, the prognosis for an ultimate cure is best, provided the complete eradication of the disease immediately follows the exploratory diagnosis. My investigation of the statistics up to date seems to show that the probabilities of a cure are at least 80 per cent. This, of course, varies with the position of the lesion.

If at this exploratory incision, however, the malignancy is not recognized and a piece of the lesion is removed for diagnosis, or even when the entire local lesion is removed with a narrow margin of healthy tissue, and then, later, after the microscopic diagnosis, the complete operation is performed, the probability of a cure is distinctly less than after a complete operation in a later stage when the diagnosis can be made from the clinical symptoms.

From an investigation of the material recorded in the laboratory of the Johns Hopkins Hospital Surgical Clinic, this statement can be made with certainty. So far as my personal experience goes, it is incontrovertible.

We may safely state therefore, that in the earlier stages of surgical lesions the diagnosis is the major part of the surgery; the operation is minor. It is expert and delicate surgery, nevertheless, and the immediate and ultimate results are the best. In this stage treatment is the test of the diagnostic technic.

In the later and latest stages of the surgical disease the diagnosis becomes the minor part, the operative surgery the major, and the results, both immediate and permanent, are worse. Here we have the test of operative technic.

The more one investigates critically the ultimate results of diseases subjected to surgical treatment, the more one becomes impressed with the fact that surgery in the hands of the majority of operators is usually a little behind the disease.

In the early stages the clinical manifestations are so slight, and the lesion seems so insignificant, that even when the diagnosis is correctly made, the relative "favorability" so impresses the surgeon that he is very apt not to do enough. If he unfortunately makes a mistake in diagnosis the result is even worse.

In the later stages of the disease the apparent hopelessness of the condition checks his enthusiasm to be radical, and here again he often fails to accomplish the possible cure.

This investigation of the ultimate results in relation to the stage of the disease, its diagnosis and treatment, demonstrates that there is room for improvement in both. The investigation should have for its object the development of a method of recognition and treatment which will allow a surgeon to be ahead of the disease, and thus increase the number of permanent cures in every stage. There is no doubt that the best opportunity for a cure is in the early stage, but we have sufficient evidence to demonstrate that in later stages more radical procedures properly performed under improved anesthesia and technic have accomplished permanent cures, and there is no reason why these should not be increased in number.

We must not rest satisfied with our results. We must not continue to follow any routine method of diagnosis and treatment, unless it is constantly controlled by the evidence of the ultimate condition of the patient.

How few surgeons in this country really know their immediate mortality, which is evidence most easily obtained. Fewer still have a comprehensive and accurate knowledge of their ultimate results, evidence more difficult and costly to obtain.

METHODS OF DIAGNOSIS

In brief, our available methods of diagnosis are not always employed. The clinician usually neglects laboratory tests; the strictly laboratory diagnostician does not put sufficient stress on the clinical investigation. There is no doubt that in many instances we are handicapped, especially in the early stages of the disease, by an absence of clinical evidence and by lack of an exact laboratory method, and in some cases the exact laboratory method may have an element of danger. For example, in the majority of cases the excision of a small piece for microscopic diagnosis has an element of danger. In malignant disease it seems to increase the probability of dissemination. We may be able to develop a technic which can reduce or eliminate this danger. In my own experience such an exploration should never be done three thousand dollars' worth of treatment, and not one cent's worth of diagnosis. I sent him to the hospital, where all the routine clinical and laboratory investigations were made. Clinically we could get from the patient only the statement as to his epigastric pain and the loss of weight. He denied luetic infection. The only laboratory test that was positive was the Wassermann. He was then given salvarsan. In two weeks the pain disappeared; in one month he had gained 18 pounds.

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* Read in the Section on Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

* Because of lack of space, this article is abbreviated in The Journal. The complete article appears in the Transactions of the Section and in the author's reprints.

In the past year I have had referred to me three cases diagnosed clinically as sarcoma of bone. These patients had been treated with Coley's serum, but refused amputation. In each case no Wassermann test had been made. In each case I found this reaction to be positive, and the periosteal swellings disappeared under salvarsan.

In 1904 I discussed this subject of the diagnosis of surgical lesions in their earlier stages[3] and presented the question more thoroughly in an address[4] before the Lehigh Valley Medical Association in July, 1911.

I have been impressed for years with the fact that surgical technic has advanced more rapidly than surgical diagnosis, and that surgeons, from their accumulated records, should present to the medical profession the minimum of symptoms of the early stage of surgical diseases in which, although diagnosis is more difficult, the immediate and ultimate results of treatment are best. I called these minimum symptoms of the earlier stages the "medical aspects," because patients seldom, if ever, seek the advice of the surgeon in this stage, but often that of their family physician, who has not been trained to recognize the significance of these symptoms as the beginning of a surgical lesion. If, then, we educate the people to seek advice earlier and the family physician to properly interpret these lesser and apparently insignificant signs of future trouble, the surgeon will be called on more often to treat surgical lesions in their earlier stages, and will be forced to educate himself to meet the new requirements in diagnosis and treatment.

It is quite possible that the people may be educated ahead of the medical profession, but, whether they seek the surgeon's advice directly or are referred to the surgeon by the family physician in this earlier stage, the responsibility of the surgeon will be the same. If the surgeon is not prepared to make the diagnosis accurately and follow it with the appropriate treatment, these enlightened people may be worse off than if they had delayed.

The question is, therefore, Shall the people force the profession, or shall the profession educate itself and be prepared for these added responsibilities?

I am impressed with the belief that those surgeons who have educated themselves best have traveled and visited other surgical clinics most. Every experienced surgeon and every surgical clinic, as a rule, excels in some particular method of diagnosis and treatment. We must therefore learn from each other; reading, of course, is valuable, but visiting other clinics is more valuable.

The family physician and the clinician who does not operate must familiarize themselves with the best methods of diagnosis and treatment, so that they will be able to refer their patients to that surgeon who will give them the best methods and insure them the best immediate and permanent results.

I shall try in the remaining space to illustrate the added responsibility of the surgeon when called on to treat certain definite surgical lesions in definite localities in the earlier stages, and discuss briefly the methods of diagnosis and the treatment which should yield the best immediate and permanent results.

PREPARATION FOR OPERATION

In the so-called acute surgical lesions there is little time for preparation and only time enough for those methods of clinical and laboratory investigation which will indicate what to do. The question to be settled is, Is there any indication for operation? Is the danger of immediate intervention less than of delay? As a matter of fact in this group the usual preparation for operation is not necessary, because the operative intervention relieves the patient of such a burden due to the acute condition that the resultant shock is often insignificant and readily borne. This is well illustrated by the difference in the behavior after operation of a patient with a non-strangulated reducible hernia, and of one with a strangulated hernia; between the convalescence from operation for acute appendicitis and for a chronic appendicitis operated on between attacks.

In acute surgical lesions delay affects chiefly the immediate mortality. The difference in the ultimate result is not so marked in the patients which recover.

The minimum symptoms of an acute surgical lesion which will allow a diagnosis in the stage which gives the best immediate and permanent results, are not such a difficult problem, and have been pretty well settled. The people are fairly well educated, and the family physician is more keen, and the surgeon better and better prepared to give the patient the best chances. This is true in acute appendicitis, in intestinal obstruction, perforation of gastric and duodenal ulcer, abdominal wounds and other acute conditions. There is room, nevertheless, for considerable improvement in the earlier recognition. The added responsibility of the surgeon when called on to treat these lesions in the earlier stage is not so evident. The chief danger is in delay, not in action. Laboratory methods of diagnosis, especially the leukocyte count, gastric lavage and the result of enemas, are often very helpful in the early hours.

In the very earliest stages of acute abdominal lesions physician and surgeons fear chiefly that an operation may be performed when the symptoms are due to a nonoperative condition, such as pneumonia or diaphragmatic pleurisy with abdominal symptoms, acute exanthems of children, or osteomyelitis with abdominal symptoms, etc. These cases are not, however, very frequent, and more deaths are due to delay on account of this fear than to operations based on mistaken diagnosis. Treatment in the late stages of acute abdominal lesions is the test for operative technic, especially anesthesia, which will be discussed later.

In surgical diseases, when there is no danger from delay, there is opportunity to exhaust every method of diagnosis and to employ every well-established preparatory treatment. The earlier the patient is seen and the less distinct the indication, the more elaborate and painstaking should be the investigation and the more careful the preparation. I believe the evidence will show that at the present stage of our development more mistakes are made by hurrying operative intervention in this chronic group, than by delay in the acute group.[5]

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[3] Bloodgood, J. C.: The Relation of Surgical Pathology to Surgical Diagnosis, Detroit Med. Jour., February, 1904, p. 337.

[4] Bloodgood, J. C.: Medical Aspects of Surgical Diseases, or Preventive Surgery, The Journal A. M. A., March 23, 1912, p. 829.

[5] Bloodgood, J. C.: Estimation of the Vital Resistance of the Patient, with Reference to the Possibility of Recovery, Ann. Surg., May, 1912; Review on Progress of Surgery, Progr. Med., December, 1912.

It has been my experience that this has been more especially so in patients suffering with symptoms suggesting chronic appendicitis. The patient, the family physician and the surgeon arrive quickly at such a diagnosis; people are so well educated in regard to the dangers of appendicitis that they welcome an excuse to have the appendix out. The preoperative treatment and diagnosis are usually insufficient. The appendix is removed through a small incision. The number of patients not relieved is increasing. The lesions usually overlooked are: some type of gastric and colic ptosis; some lesions of the pelvic organs or vaginal outlet; gastric or duodenal ulcer; chronic infections of the gallbladder; chronic pancreatitis; cancer of the colon, and even renal calculus.

When patients suffering from chronic surgical disease in its earlier stages are really thoroughly studied, the number of mistakes of this kind will be greatly lessened, and by careful preliminary treatment and operation under improved anesthetic technic the number of reoperations will be reduced, the immediate and permanent results improved almost to 100 per cent., and the period of discomfort and disability so shortened that surgery will not be feared as it now is.

ABSTRACT OF DISCUSSION

Dr. A. B. Kanavel, Chicago: One point made by Dr. Bloodgood is well worth consideration, and that is this: When the clinical observations are not borne out by physical examination, we should not of necessity accept the results of the latter. In the present stage of pathologic diagnosis of disease, we are in danger of being too much inclined to depend on a microscopic examination when it is at variance with clinical observation. Clinical observation formed the basis of diagnosis by the older practitioners. In gall-bladder disease there is no need of waiting until the patient has jaundice, when the diagnosis can be made long before the appearance of the jaundice. Why, in appendicitis, wait until the patient has either a general or a local peritonitis? And in ulcer of the stomach or duodenum, why wait for a perforation? We must learn to appreciate the value of an early diagnosis in these cases and that can be done only by having a proper respect for and being able to recognize early symptoms, so that the patient may be sent to the surgeon promptly. The surgeon should teach himself to differentiate medical from surgical lesions, without any relation to which surgical lesion is present, so that he may be prepared to operate on a patient early and not wait for the later symptoms which make the case more severe. In chronic cases particularly, patients are kept waiting for months and even years before they are operated on, and then it is often too late. The greatest difficulty comes in the acute cases of which Dr. Bloodgood spoke. Patients come to us with a typical surgical syndrome; they complain of nausea and vomiting and sudden severe abdominal pain, followed in a few hours by tenderness and rigidity of a portion of the abdomen. It does not matter which particular organ gives rise to that syndrome of symptoms. It means that there is present a severe surgical lesion which demands intervention. It may be an appendicitis, a gangrenous gallbladder, a peritonitis, a duodenal ulcer, a strangulated ovarian cyst, a diverticulitis, or something else, but, no matter what it is, immediate surgical intervention is indicated. To my mind, if the surgeon and physician would recognize this group of symptoms as essentially a surgical syndrome and would impress that fact not only on the patient but also on the general practitioner, the operation would be performed much sooner than it is now, and more patients would be saved. Unfortunately, the necessity for early surgical intervention is not recognized at a time when the greatest good could be accomplished and the result is that the surgeon is called on to treat a complication rather than an early stage of the condition, and the patient's recovery is made more difficult. I urge that this syndrome be recognized as an acute surgical abdominal crisis, a clinical entity demanding surgical intervention.

Dr. A. J. Ochsner, Chicago: We all recognize the splendid work Dr. Bloodgood has been doing in the past in establishing what we might call clinical and pathologic facts. His work has given us a tendency to standardize our views regarding clinical studies of cases, as well as end results. When we have come to the point at which there is great uniformity in our methods of determining a diagnosis, so that we have definite ideas which are almost universal in our profession, then the time will come when we shall make the fewest mistakes. The matter of etiology, pathology and treatment is quite different. Precedent has shown so far that every time in medicine and surgery when we have felt absolutely sure about anything, we have been mistaken. That is exactly what will happen when we have completed our standardization to a degree of uniformity. It is always well to maintain a beneficent distrust of anything that is settled. In Dr. Bloodgood's work, all of these old, well-established facts that everybody took for granted have fallen down. In the future what Dr. Bloodgood is doing and is teaching us to do will come to the same end. As an instance we may take the plan of determining pathologic conditions during the progress of an operation by means of frozen section. In removing a growth, if the pathologist makes his section through the malignant portion, he diagnoses cancer, but if he has made a section through a portion of tissue that does not show cancer, he will make the opposite diagnosis. He may make many sections but miss the portion which contains the nodule of malignancy. If we accept his diagnosis, we do not do the radical operation and the patient suffers as a result of this systematic, well-established and universally accepted method; we must not forget, therefore, the great importance of not trusting any system. I wish to point out one most important thing that Dr. Bloodgood has told us. He has found that wherever there is a superficial cancer it has developed on a previous lesion. That means that cancer is infectious and that in every one of these cases the infection took place at the seat of a previous lesion.

Dr. Frank D. Gray, Jersey City, N. J.: This question deals with responsibility and I should like to call the attention of the surgeons to two kinds of responsibility which they must shoulder. First, there is the responsibility of never operating with a fixed conception of a diagnosis, because you may frequently find that the diagnosis is wrong and that you must do something other than you had planned. You know how frequently that applies to appendicitis. We operate and find a normal appendix. Something must be found to account for symptomatology. Too frequently in the past, and I fear too frequently to-day, many of us were satisfied with the fact that we had operated and found nothing, and we did not try to find the real trouble. I shall mention a case in point: A nurse in one of our hospitals had, for a year, symptoms referable to the stomach. She had vomited persistently. She had pain beginning from an hour to an hour and a half after eating. She said that she had vomited blood. The history was suggestive of gastric ulcer. Stomach analysis did not confirm the suspicion; there was hypoacidity instead of hyperacidity, yet this, of course, did not disprove the diagnosis of cancer. One of the physicians in charge of the case suggested gall-bladder disease. At the same time we both realized that the appendix might be at fault. I operated with the idea that I would find a gastric ulcer, but an incision revealed nothing pathologic in the stomach. I investigated the gall-bladder region, but it, with the common and cystic ducts, was normal. I extended my incision downward far enough to explore the right iliac region and found a pericolic membrane and an appendix which did not look normal. I therefore removed it. Subsequent histologic examination of the appendix showed a chronic appendicitis. The patient had two definite pathologic entities, Jackson's films and a chronic appendicitis. A gall-bladder operation would have been absolutely useless because there was nothing wrong with the gallbladder. The same was true of the stomach.

Then there is our responsibility to prevent infection. I take it that most of the profession depend to-day on iodin to sterilize the field for operation. Up to a year ago I had been in the habit of applying iodin when the patient was placed on the table. Many of my colleagues to-day are using that routine. A year ago I was unfortunate enough to operate in a case of double hernia which became infected on one side. The operation was clean and there seemed at first no reason for the infection. The only way in which I could explain the infection was that the iodin had twenty or thirty minutes longer on the left (infected) than on the right (uninfected) side. I therefore concluded that it was a mistake to operate immediately after applying the iodin; I now apply it twelve hours before operation. In emergency cases requiring immediate operation, we use gasoline for the first cleansing. It is dehydrating as well as cleansing, and is a better preliminary for iodin than soap and water.

Dr. H. C. Sharp, West Baden, Ind.: The leukocyte count is to me a very important additional guide as to the course the surgeon should pursue in acute abdominal conditions, especially that of appendicitis. The surgeon is frequently much in doubt as to whether immediate operation or treatment by the expectant plan offers the best chance to the patient. I have often found that when wavering on that point, the degree of leukocytosis has determined my course of procedure. When I find this acute condition with a leukocyte count of 16,000 or more, I feel well assured that the condition will go to suppuration, and that the wiser thing to do is to operate immediately, while if I find a low leukocyte count, say 10,000 or 12,000, I am reasonably assured that the patient will recover from the acute atack without suppuration, under the Ochsner method of treatment. I do not wish to be understood as advocating that the degree of leukocytosis should determine whether or not to operate in all cases, nor do I even present it to you as an established and unfailing fact that all acute cases of appendicitis, with a leukocyte count over 16,000 will suppurate, and that all cases with a count of 12,000 will not suppurate, but I have found it a valuable indication to assist in determining my procedure.

Dr. Joseph C. Bloodgood, Baltimore: We need more studies on the ultimate results of a large group of cases of the same lesion in which the question of diagnosis in the early stage and the operation which gives the best result should be considered. There are a number of reasons why we do not have that in this country. It is a very great labor and a great expense to consider a group of say five hundred cases and carefully sift the clinical evidence and the operative results. I know that that is true because I have paid for it myself. Nevertheless, we need such studies in this country and until we obtain conclusions based on such investigation we are not prepared for any uniformity in regard to the method of diagnosis and treatment in our cases. I believe with Dr. Ochsner that we must be careful about being definite, but so long as definite conclusions are checked up by the ultimate results, and these results show that diagnosis and treatment along those definite lines give better results, we must follow those lines. There will be an exception to every rule, but that exception in my experience does not injure the rule. We shall probably never reach the stage of exact diagnosis and treatment in every case, but we can improve our results; we must improve our results, if we wish to have patients come for treatment early. I have been so convinced of this that I wrote some friends of mine, asking for money. I said that I wanted to be able in four months to get the results of every case of cancer treated in Johns Hopkins in the last twenty years, and of every case of tumor of which I had a record in the laboratory. The first check to come in was for five hundred dollars, and feeling that more would come I began the work. I have had a group of ten volunteer students and three volunteer patients, and I find that it is going to cost me about four hundred dollars a month for four months. You can see the cost of an investigation of this kind. It seems to me that the clinicians in this country, spending hundreds of thousands of dollars on marble in their operating-rooms, might cut down on the marble and add to the force in the history room. We are not utilizing our medical students as we should. In Baltimore we have medical students who are getting only their board and lodging do this work because it is an education for them. I believe that in the future we shall be able to keep up the results of our work to date by volunteer students, without cost to the university, because the minute a student writes to Jones and Jones writes back that he is all right, that record is of living interest. The student looks at the history, he examines the tissues in the museum and the slides, and he has a record of the fact that John Jones, whose history and specimens show cancer, is well after twenty years. I think that we can get the hospitals which are spending too much money on unnecessary things to give some of it for clerical help to prosecute this study.

ON THE MECHANICS OF PRODUCTION OF CERTAIN FRACTURES

GREENSTICK FRACTURES, BUCKLING FRACTURES, FLEXION AND TORSION FRACTURES [*]

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SAN FRANCISCO

Much of the etiology of fractures, particularly from the teacher's point of view, may be presented as an application of the principles of practical mechanics—a part as it were of the subject of the strength of materials in engineering. With their characteristic thoroughness the Germans have given a good deal of attention to the mechanics of the etiology of fractures, particularly to flexion, torsion and perforation fractures, but American surgeons have been too much engrossed in the more practical problems of therapy to devote much attention to the somewhat abstruse mathematical considerations as to how the different forms of fracture happen to be produced, and the text-books used by our students have little to say on the subject.

In the multitudinous forms of accident causing fracture, the bones of the skeleton are subjected to stresses which in the ultimate analysis may be resolved into tensile and compressive stresses. These almost never occur singly but always in combination as in flexion, torsion and shearing stress. Their interrelations may be worked out mathematically and by experiment.

To these must be added shock or vibration, the effect of which in producing rapidly alternating molecular tension and compression is difficult to analyze and to estimate except in so far as shock is a determining factor in time. It is at least a sort of exciting cause, for when a bone is under bending or torsion stress almost to the breaking point, sudden shock or rapid and intense vibration will start the fracture, doubtless modifying its direction to some extent. In gunshot fractures, however, in which the shock or vibration is intensified as a result of the velocity of the impact, this factor is of almost completely determining significance.[1]

Impact at low velocity simply tends to displace the bodies as wholes, which displacement, in the case of the long bones of the skeleton, resolves itself into bending or torsion or both, while impact at high velocity in addition tends to produce local bruising or crushing; hence its penetrating power.

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[*] Read in the Section on Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

[*] Because of lack of space, this article is abbreviated in The Journal. The complete article appears in the Transactions of the Section and in the author's reprints.

[1] Schumacher: Der Mechanismus der Lochfrakturen, Beitr. z. klin. Chir., 1909, lxiii, 81.

The simplest form of stress involved in the production of fracture is simple bending, illustrated in mechanics by the stresses in a beam supported at its two ends and carrying a load between the supports. Compressive stress is developed on the side of the application of the load—a maximum at the particular point of its application—while tensile stress is developed on the opposite side of the beam—a maximum at a point more or less directly opposite. When the load *P* (Fig. 1 *A*) is sufficient the beam will break, the fracture beginning at *T* or *C* according to the properties of the particular material. A cast-iron beam of uniform cross-section will begin to break at *T* where tensile stress is a maximum, while a similar wrought-iron beam will yield by buckling at *C*.

Quite similar are the conditions when a beam is rigidly fixed at one end and made to carry a load at the other. Tensile stress is a maximum at *T* (Fig. 1 *B*) and compressive at *C*.

The shafts of normal adult bones invariably break by yielding to tensile stress rather than to compressive, and in transverse fracture practically always break from simple bending strain as in Fig. 1 *A*, in fracture by direct violence, and as in Fig. 1 *B*, in fracture by indirect or transmitted violence.

The line of fracture is seldom exactly transverse even in a crystalline beam, for in the most rigid beam there is some bending which increases as the line of fracture progresses through the beam, and generally a point is reached at which the cohesion or resistance to the tensile stress in a transverse sense is equal to or less than that in the longitudinal, and the line of fracture takes a more or less oblique direction *a b* or *a c* or both (Fig. 2 *A*). In the latter case a loose fragment is separated off. Note that this loose fragment is on the side of the concavity.

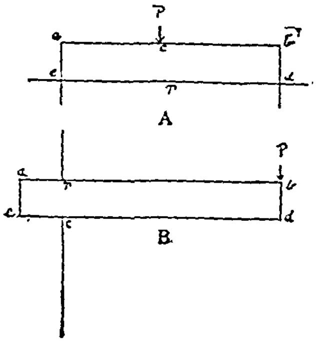

Fig. 1.—Diagrams illustrating *A*, compressive stress; *B*, tensile stress.

In rare cases in which the transverse cohesion is low compared to the longitudinal, simple bending may cause a longitudinal split in the shaft of the bone, the line of fracture at both ends running out on the side of the concavity—the piece broken off is squeezed out, as it were, on that side (Fig. 2 *B*).

While simple bending stress most frequently causes fracture more or less transverse, it may on occasion cause very oblique or longitudinal fractures not only as stated but also as in the case of the femur or the humerus in which the bone is bent inward over a fulcrum on the inner side. The fissure starts between the attachment of the capsule and the trochanter in the case of the femur and the tuberosities in the case of the humerus, and runs down the shaft, generally emerging on the inner side. Such a fracture I have seen which resulted from the use of the Astley Cooper method of reduction of a dislocated humerus, the operator's heel furnishing the fulcrum (Fig. 2 *C*).

In a structure in which there is a definite longitudinal grain as in tough wood subjected to severe bending strain the point *a* (Fig. 2 *A*) is reached before the line of fracture has extended far into the beam, and more or less extensive longitudinal fractures result with bending of the unbroken portions on the side of the concavity; that is, because of the resistance of the broken parts to further bending, they being released from longitudinal tension at the point of fracture, transverse stensile tresses are developed even in advance of the line of fracture and longitudinal fracture results which is often multiple, as in the breaking of a hickory axe-handle (Fig. 3 *A*).

This is precisely the conception of the so-called greenstick fracture; but the lateral cohesion of the shafts of long bones is relatively so large that one would expect this mode of production of incomplete fracture to be rare in children. Yet most of our text-books set forth the greenstick fracture as typical of incomplete fracture in young bones, and of frequent occurrence.

Scudder defines a greenstick fracture as a partial break across the bone with bending at the seat of fracture.

Clinically it is true that fractures with bending occur frequently in children, but it is a question in how far they are of the type described and are properly designated greenstick fractures. My personal observation is to the effect that the true greenstick fracture according to the definition herein given, is the exception among the incomplete fractures in children, which are for the most part buckling fractures, that is fractures by compression, or are complete fractures with splintered ends but with only angular displacement. The only case of greenstick fracture proper which I have seen was in a man of 28, and was of the type illustrated in Fig. 3 *B*.

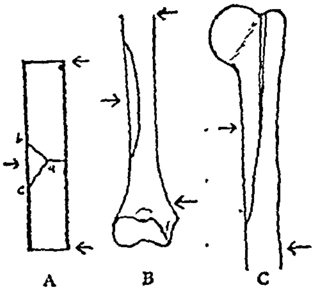

Fig. 2.—*A*, oblique fracture; *B*, longitudinal fracture; *C*, oblique fracture of humerus caused by leverage, in Astley Cooper method of reducing dislocation.

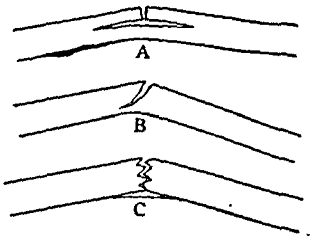

Fig. 3.—*A*, the usual conception of greenstick fracture; *B*, the usual finding in incomplete fracture in young adults; *C*, the usual finding in incomplete fracture of the shafts of bones in children.

Several factors come into play in producing the bent fractures in the long bones of children. The child's weight and strength (important elements in determining the amount of force active in causing many fractures) are small in proportion to the size of the bones in comparison with these relations in the adult. The bones are tough rather than brittle and are surrounded by a much more yielding investiture of periosteum and growing bone than are adult bones, and the greater amount of fat in the child's arm protects the bone from shock.

Transverse fracture with lateral displacement does, however, occur in children if force enough is used, but often in incomplete fractures the force is expended as the tough bone yields and ceases when the bending reaches a certain point short of complete separation of the ends. Under such circumstances the enmeshed jagged splinters offer some resistance to lateral displacement and prevent rotation (Fig. 3 *C* and Fig. 4).

German teachers do not use the term "greenstick" fracture, but account for the bent fractures of children by the looseness and the toughness of the periosteal investiture which stretches and in these cases is supposed not to be torn completely across. Cotton[2] has come to the same conclusion in his paper on subperiosteal fractures in children.

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[2] Cotton: Boston Med. and Surg. Jour., Nov. 29, 1900, p. 533.

Roentgenoscopy in many so-called greenstick fractures in children after healing has advanced, even when no attempt has been made to reduce the fracture, will show callus on the side of the concavity as well as on the side of greater separation (Fig. 5). This would indicate either that the periosteum is ruptured or that it has been torn up, that bleeding has occurred beneath it and new bone has grown out into the clot.

While the distinction between the conception of greenstick fracture and complete fracture with jagged splinters and only angular deformity may be looked on as merely a quibble, it has this practical significance: It was common teaching to advise that the incomplete fractures in children be made complete in order to restore proper alignment, but some surgeons (Cotton) deprecate this advice on the ground that completing the fracture is unnecessary and increases the difficulty of maintenance of the correct position.

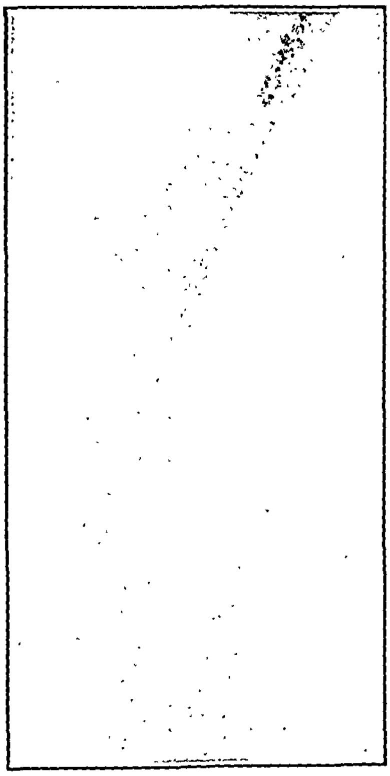
Fig. 4.—Bent fracture of radius and ulna in child of 12.

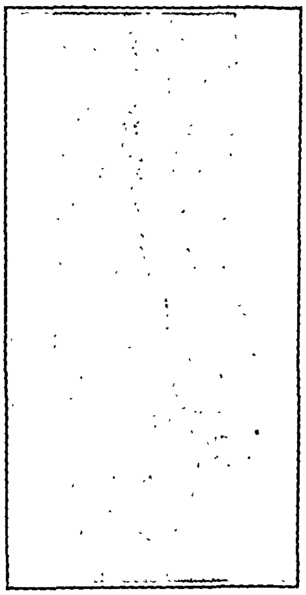
Fig. 6.—Buckling fracture of radius in boy of 8, showing limits of compact bone of the shaft.

For the common form of incomplete fracture of the middle of the shaft of the child's bone, which as said before is really a complete fracture with only angular displacement, simply bending the bones back into place is efficient because there is nothing to break and the soft periosteum will stretch—unless so long a time has elapsed after fracture as to permit of a considerable degree of healing; but perfect reduction in the rare greenstick fracture is almost impossible without completing the fracture, for the reason that reduction requires a certain amount of stretching on the side of the concavity. Therefore, in my opinion, it is proper practice to complete the fracture in such cases by exaggerating the angular deformity present, taking care, however, not to go to the point of tearing apart the periosteum on the side of the concavity, for in general, especially in young bones, the less the periosteum is torn the less opportunity is afforded for the osteoblasts to grow out into the muscles, producing exuberant callus and interfering with subsequent function.

In the long bones of children the medullary canal is smaller than in adults and is especially undeveloped toward the ends. The compact bone of the shaft becomes thin much farther from the ends than in adult bones and the cancellous bone extends correspondingly farther from the epiphyses. In this region, in which incomplete fractures in children's bones are most common, for example, in the radius, the bone, like the wrought-iron beam, breaks by buckling on the side of the compressive stress (Figs. 6, 7 and 8).

Of American text-books on fractures, Hamilton, Stimson, Scudder and Cotton do not so much as mention fracture by buckling.

Of seventeen incomplete fractures of the radius and ulna in children of which we have roentgenograms in Lane Hospital, eight were typical buckling fractures occurring from 1 to 1½ inches above the lower epiphyseal line, half an inch or so below the upper epiphyseal line of the radius, and one was a fracture of the olecranon below its epiphyseal line. Of the eight near the lower end of the radius and ulna, six buckled on the dorsal surface and two on the volar (Fig. 8). The remaining seven were complete fractures with only angular displacement, some of them old enough after fracture and before attempts at reduction were made to show callus, which was quite as marked on the side of the concavity as on the side of the convexity. With the exception of one fracture of the ulna complicating one of the buckling fractures of the radius included above, within 1½ inches of the lower epiphysis, all of these complete fractures with bending were more than 2 inches above the lower epiphyseal line.

While the complete fractures with bending, if taken early, may be reduced by simple bending back into position, the fracture by buckling ordinarily cannot. But the buckling fracture should not be completed by increasing the flexion deformity present as is proper in the true greenstick fracture, but in forcing the bones back into correct position (slight overcorrection is desirable) the bone breaks, beginning at the buckled portion. There is no necessity, however, of so far overcorrecting as to tear the periosteum on the side of the former convexity.

Epiphyseal separation in children as in adults is apparently always the result of tensile stress, the epiphyses being pulled off.

The short bones and epiphyses of young children are almost never broken because of the large amount of cartilage they contain; in adults these bones break by yielding either to compressive or to tensile stress about equally, but, in the matter of relative frequency, individual bones differ from one another. For example, the patella, the olecranon and the lower epiphysis of the humerus are not infrequently broken by being pulled apart, but all three are almost as frequently crushed by direct blows. The os calcis when broken is generally crushed, as is the astragalus and the carpal semilunar.

Shearing stress gives few examples of fracture, yet in the cleavage fracture of the neck of the astragalus, the result of exaggerated flexion at the ankle, the sharp anterior edge of the articular surface of the tibia fairly cuts the head off the astragalus. The body of the bone is crushed and generally pushed out behind the inner malleolus (compare the cherry-stone theory of dislocation of the short bones). The common fracture of the carpal scaphoid may be looked on as of the same sort, but it more probably is a flexion fracture, the styloid of the radius being the fulcrum. From a severe blow on the flexed elbow in line with the shaft of the humerus the olecranon may cleave the humeral condyles apart, or the trochlea may cleave apart the upper end of the ulna.

Of recent years a great deal of interest has centered in the so-called torsion or spiral fractures which we are beginning to realize are far more common than at first supposed. They were formerly classed with oblique fractures, but as the etiology of spiral fractures is better understood and the examples of both are studied, the class of oblique fractures is becoming smaller till it is largely merged in that of spiral fractures.

The long bones are frequently subjected to severe axial torsion, particularly the bones of the lower extremity and the humerus, resulting in typical forms of fracture which are of fascinating interest mechanically and therapeutically.

If a cylinder of approximately uniform constitution be subjected to axial torsion till it breaks, it is found that fracture has occurred in the form of a spiral, the direction of which is invariably the same as the direction of the torsion; that is, if the torsion be to the right (clockwise) the spiral will be a right-handed spiral like an ordinary screw-thread; and, vice versa, if the torsion be to the left the spiral will be left-handed. The fracture is completed by a more or less longitudinal fracture connecting two limbs of the spiral. This may be simply illustrated by twisting axially an ordinary chalk crayon till it breaks.

My attention was first called to the fact that a right-handed twist always produced a right-handed spiral fracture and a left-handed twist always a left-handed spiral by Theodor Kocher in 1899, and later by Dr. Monks of Boston, who made a series of experiments to determine the matter. The mechanics of the production of the spiral was put into graphic or mathematical form by Zuppinger.[3]

Axial torsion develops tensile stress throughout the surface of a cylinder balanced by compressive stress in its interior. When the bone yields to the tensile stress the fissure is propagated along and around the shaft for a long distance in spiral form, and the spiral may encircle the bone two or more times, the bone opening out like a curled shaving from a carpenter's plane. As soon as spiral fracture has occurred, further torsion or unrolling instantly shifts the tensile stresses to the inner surface in a hollow cylinder and the compressive stress to the center. If continued, therefore, the torsion causes longitudinal fracture connecting two of the limbs of the spiral and thereby completing the separation of the two ends of the bone.

In spiral fractures we generally find the spiral running some distance beyond both ends of the fragments (Fig. 9). We also find the periosteum forming a hinge along the longitudinal portion of the fracture in those cases in which there has been no considerable longitudinal force producing shortening; but even in this event the periosteum, though stripped up, is often intact on the side of the vertical part of the fracture, while it is generally completely torn along the spiral part.

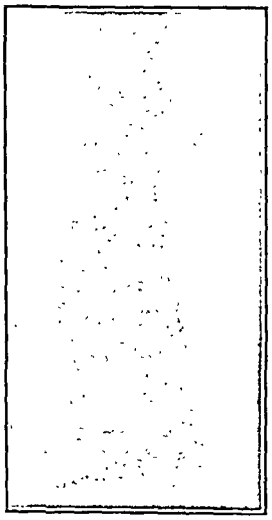
Fig. 7.—Same as Fig. 11, dorsal view, showing lateral spreading of cancellous bone at point of buckling.

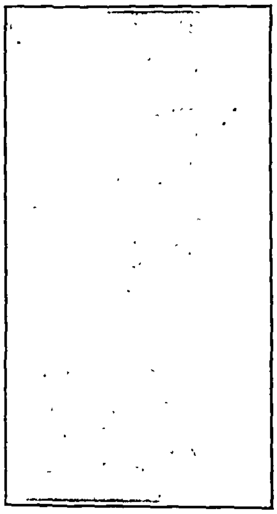
Fig. 8.—Buckling fracture with volar flexion in boy of 11.

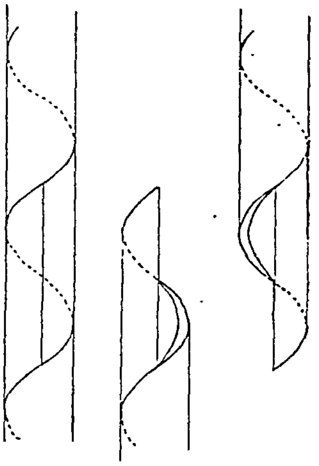
Fig. 9.—Type of spiral fracture before and after separation of fragments.

Theoretically, under torsion stress the entire surface of the shaft of a bone being under tensile stress in parallel spirals, the bone might be expected to break occasionally in two or more parallel spirals. That it ordinarily breaks in but a single long spiral is determined by some weakest point in which the fissure starts, and this is apt to be single. However, it is not at all impossible that search through a large collection of fractured bones might reveal instances of multiple spiral fractures.

Loose fragments which are common in such fractures may sometimes be accounted for by multiple longitudinal fractures, but more often additional bending forces break off one or the other of the long tongues of bone between the spiral and the vertical parts of the fracture.

In actual clinical experience spiral fractures are seldom due to pure torsion, especially in the lower extremities. Weight bearing and sudden muscular effort to escape furnish a severe longitudinal force which, continuing to act after fracture, not only cause the stripping up of the periosteum and furnish the bending stress which breaks off the points of bone or drives them through the muscles and even the skin, but also may be conceived to play some rôle in the production of the fracture in the very beginning, adding a component of longitudinal shearing stress which would have the effect of increasing the pitch of the spiral. Pure spiral fractures are apt to be of higher pitch in young bones than in old, in small bones than in large (Fig. 10).

The vastly greater frequency of left-handed spiral fractures in the right lower extremity and of right-handed spirals in the left lower extremity has been tentatively accounted for on the basis of a spiral grain in the bones resulting from the internal rotation of the lower extremities in the process of development, to which Fleming called attention. In case this internal rotation is inhibited, as in the sympus or siren deformity, the toes invariably point backward. It is obvious enough that as between the upper and lower extremities the latter extremity has a relative rotation of 180 degrees internally, the flexor surfaces being behind instead of in front.

It would require exhaustive experiment to measure the relative resistance of living bones to internal and external rotation, but it would seem that the before-mentioned frequency of left-handed spiral fractures in the right lower extremity, and vice versa, might be efficiently accounted for by the greater frequency of exposure of the legs to external rotation. Most of such spiral fractures occur as the result of twists of the body, the foot being fixed. Since the foot projects forward or forward and outward it is more exposed to external rotation than to internal, for the other leg is in the way of internal rotation. Furthermore, left-handed spiral fractures are relatively quite as common in the right upper extremity which has not undergone the 180 degrees of internal rotation.

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[3] Zuppinger: Beitr. z. klin. Chir., 1906, lii, 301, and 1909, lxii, 562.

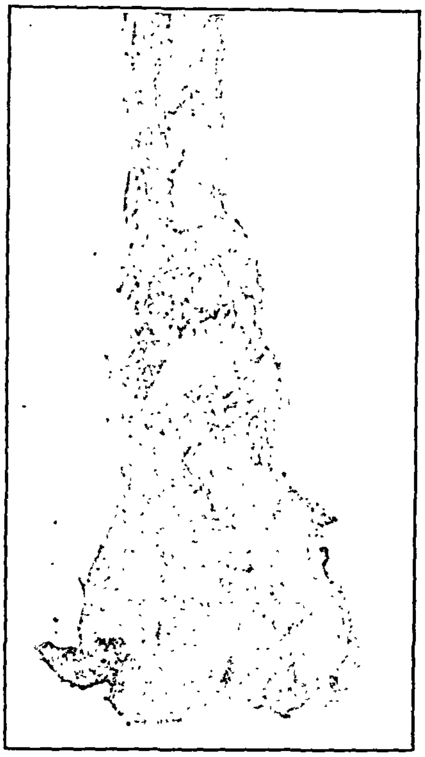

Fig. 13.—Experimental spiral fracture (right-handed) in right femur, periosteal hinge along longitudinal portion of fracture.

Fig. 11 is a roentgenogram of a right-handed spiral fracture of the left femur caused by muscular action on the occasion of the receipt of a bullet in the external condyle of the femur, and Figure 12 is a roentgenogram of a left-handed spiral fracture of the right humerus resulting from throwing a baseball. The spiral went more than twice around the bone. The fracture in the latter case being a pure torsion fracture had no longitudinal displacement, but operative reposition was required because of the entrance of a mass of muscle between the fragments. In another case a burglar running through a sand lot was shot in the right leg. The foot being fixed in the sand inhibited internal rotation as the man jumped and a left-handed spiral fracture resulted.

The right femur may be broken in a right-handed spiral by a right-handed twist as is shown in Figure 13, the result of an experiment on the dead bone with periosteum intact. The periosteum is torn almost the whole length of the spiral but makes a hinge along the vertical part of the fracture, which in this case was on the side opposite the linea aspera.

In the upper extremity the projection forward of the flexed forearm, which is the lever producing most of the spiral fractures of the humerus, effectually prevents internal rotation to the point of fracture by striking the body except when the arm is raised far from the side.

Torsion fracture of the fibula is less common than of the tibia, for often in torsion fracture of the tibia the weight of the body being borne by the fibula off center produces a flexion fracture; still if pure torsion be continued after the tibia has broken, spiral fracture of the fibula will be produced. Spiral fracture of the fibula does not occur without fracture of the tibia except of the external malleolus, which is not infrequently broken in a right-handed spiral on the left leg and left-handed spiral on the right leg, the force being an external rotation of the foot.

I would close with a plea that in presenting the subject of fractures to a class of students the matter be looked on in the beginning from the point of view of mechanics. Experimental study should be given to the manner of breaking of plaster, clay, wood, old rubber, dead human bone and, since living bone breaks differently from dead bone, bone freshly removed from recently killed laboratory animals.

1795 California Street.

ROENTGENOSCOPY OF THE LIVER AND BILIARY PASSAGES WITH SPECIAL REFERENCE TO GALL-STONES *

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It seems timely to emphasize the possibilities of soft tissue roentgenography in the recognition of diseases in the right upper quadrant of the abdomen. The purpose of this paper is to call attention to a number of facts concerning the biliary tract, and particularly the gallbladder, obtainable with the aid of the Roentgen-ray. I wish to preface my remarks by insisting on the necessity of a careful history and a thorough physical and laboratory examination of the patient by the other older-established methods before a correct estimate can be placed on the roentgen findings.

The liver, being opaque to the Roentgen ray and surrounded by more or less transparent organs, permits a study of changes in its position, its size and its shape—often contributory evidence of considerable value. The outline of the upper border of the liver is easily determined. Roentgenographically speaking, the diaphragm is inseparable from the normal liver, their shadows being one, forming the so-called phrenohepatic shadow. The brightly illuminated pulmonary field presents a sharp contrast to the general gray dimness of the abdomen, permitting the upper border of the liver to be accurately studied. One may recognize even slight irregularities in its contour. In a number of cases, a nodular condition of the liver, later verified by operation or necropsy, was determined by a study of the phrenohepatic shadow.

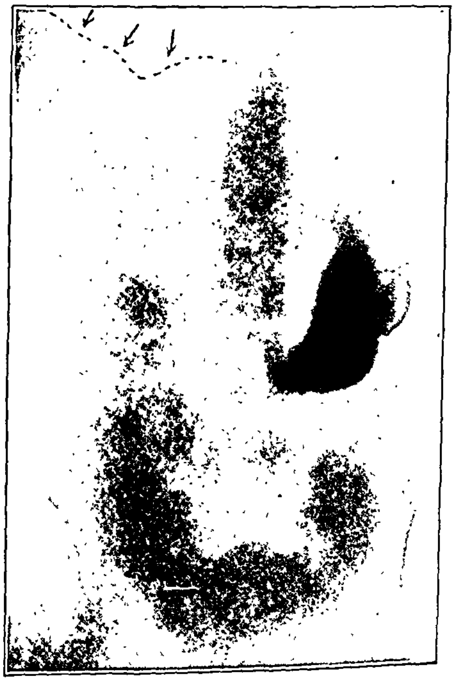

Fig. 3.—Secondary carcinoma of the stomach. Six gall-stones present. Note the irregularity of the phrenohepatic shadow, contributing to the diagnosis of metastatic secondary carcinoma of the liver.

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* Read in the Section on Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

* Owing to lack of space, this article is here abbreviated by omission of the details of technic, which appear in full in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on request.

The shadow of the inferior surface of the liver, however, is not so easily determined, being confused with the image of a number of organs—the right kidney, the duodenum and the great vessels, and probably also the colon. In order to emphasize the inferior border of the liver shadow, distention of the colon or stomach or both by means of gas may be practiced. The colon is frequently found already distended by gas collections or it may be artificially distended through the rectal injection of air. Inflation of the stomach may be secured by giving first a solution of 4 gm. of sodium bicarbonate in a quarter of a glass of water, followed immediately by a slightly smaller amount of tartaric acid in an equal quantity of water. Except in special studies, it is rarely necessary to practice this maneuver. In the majority of roentgenograms of the bismuth-filled stomach and colon, the inferior border of the liver, at least its lower two-thirds, is distinctly outlined.

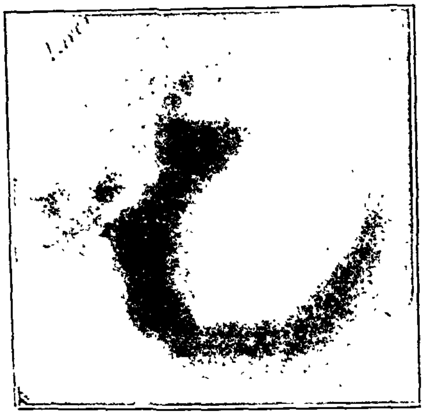
Fig. 4.—Bismuth and gas filled the colon, emphasizing the shadow of the lower border of the liver. Colon adhesions in the gall-bladder region.

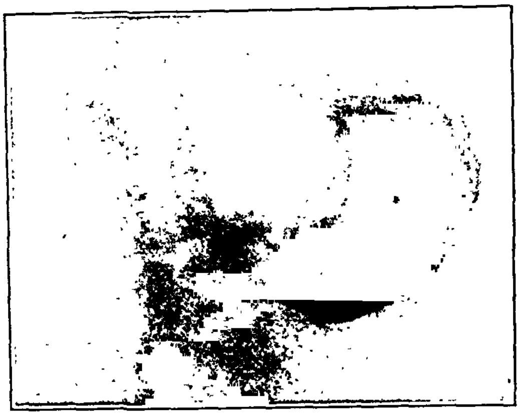
Fig. 5.—Lesser curvature of the stomach distorted by enlarged left lobe of the liver. On fluoroscopic examination peristaltic waves were distinctly seen, proving the tumor to be extraventricular.

Normally the diaphragm and the liver are inseparable. When the shadow of the diaphragm is separated from the liver by an area of clear or transparent tissue, the appearance is very suggestive of abscess. Occasionally a case may be encountered in which an abnormal position of the transverse colon gives rise to a change in the percussion note, which together with the roentgenographic appearances, may lead to the diagnosis of hepatic abscess. Further investigation may show an abnormally long mesocolon, permitting unusual mobility of the colon so that it rises above the superior surface of the liver. The possibility was first described by Chilaiditi, who reported several cases.

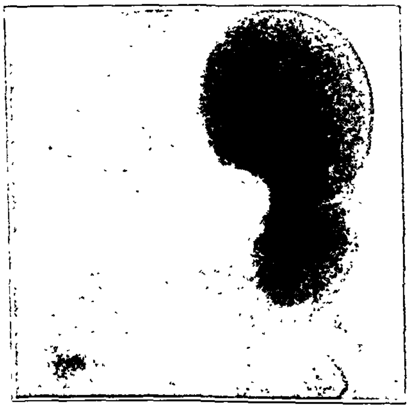
Fig. 6.—Lesser curvature of the stomach deformed by a carcinoma of the lesser curvature. Repeated plate and fluoroscopic examinations showed no peristaltic waves.

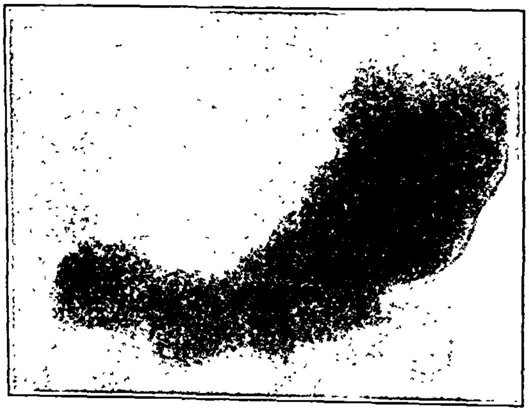
Fig. 7.—Hepatofixation of the stomach, the pylorus being drawn upward and to the right by adhesions due to gall-bladder disease. Two gall-stones present in this case.

Roentgenographic study of the liver is especially valuable in the location of abscess on the posterior or superior surface of the liver. Only in the most extraordinary cases is the Roentgen ray likely to give information concerning abscess in the lower portion of the liver, the abscess extending downward instead of upward toward the lung.

Among the appearances suggesting subphrenic abscess are the following: 1. Diaphragm movements limited and painful, with resulting immobilization of the liver. The other portion of the diaphragm, usually the left, varies its position as usual, or is perhaps more free, in a compensatory manner. 2. The contour of the upper surface of the diaphragm projects unusually high into the clear zone of the lungs. 3. Pulmonary involvement may be seen, the result of infection or rupture. 4. If gas is present in the abscess, the level of the fluid will be discernible beneath the diaphragm, the surface of the fluid remaining horizontal regardless of the position of the patient.

In nodular carcinoma of the liver, relatively satisfactory results are obtained with the Roentgen ray. Roentgen study of the patient in an oblique, posterior position, may also determine the presence or absence of enlarged lymph-nodes of the mediastinum. Following the removal of a tumor of such a nature that the occurrence of metastases is feared, systematic roentgenoscopy may give accurate information as to the location of metastatic foci.

Occasionally a bismuth meal examination reveals a deformity of the lesser curvature of the stomach, when it is necessary to differentiate a lesser curvature tumor from pressure of the border of the enlarged liver. In such instances, determination of the presence or absence of peristaltic waves on the lesser curvature through fluoroscopy or serial roentgenography will permit the differentiation.

ROENTGENOGRAPHIC EVIDENCES OF GALL-STONES AND CHOLECYSTITIS

It has been generally understood for a number of years that it was scarcely worth while to submit a patient to Roentgen examination for gall-stones. This belief was founded on the fact that the principal constituent of gall-stones is cholesterin and that many gall-stones consist almost entirely of pure cholesterin. The experience of Carl Beck of New York only served to confirm this idea. Furthermore, the comparative infrequency with which gall-stones have been discovered in many thousand routine examinations of the urinary tract, as compared with the estimated frequency of gall-stones, according to necropsy statistics, has further served to discourage roentgenographic search for them.

Good authorities, such as Naunyn, have asserted that gall-stones are present in 10 per cent. of individuals. W. J. Mayo, in commenting on these statistics, calls attention to the fact that these high percentages have been obtained by post-mortem material from large hospitals, old ladies' homes, almshouses, etc., and that the illnesses or disabilities which brought these people to the hospitals were, in themselves, "sufficient to bring about gall-stones or to be caused by such disease." Mayo concludes that 0.5 per cent. would be a fair estimate of the frequency of gall-stones in persons of all ages; that 5 per cent. to 8 per cent. of women and 2 per cent. to 4 per cent. of men have gall-stones after the age of 50.

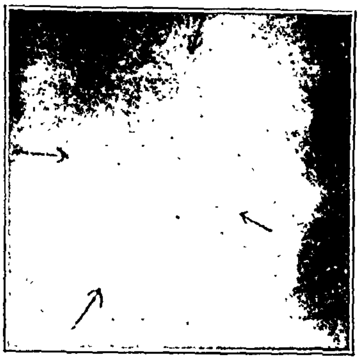

Fig. 8.—Four large gall-stones. Note the capsule-like shadow characteristic of certain gall-stones.

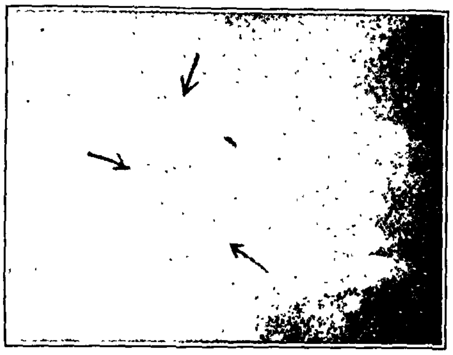

Fig. 9.—Thirteen gall-stones.

In my last thousand cases for examination of the gastro-intestinal tract following the bismuth meal, including a number of cases suspected of cholelithiasis, gall-stones have been identified, roentgenographically, in forty cases. In eight other cases, not examined with bismuth, roentgenograms of gall-stones have been obtained. The large number of gall-stone examinations in connection with the bismuth meal is accounted for by the fact that I do not recommend mere Roentgen examination of the gall-bladder region when searching for stones, but insist that the bismuth examination of the stomach, at least, and preferably of the stomach and bowel, should be included as a part of the Roentgen examination of the gall-bladder.

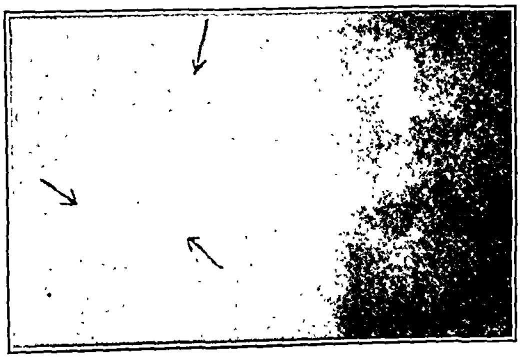

Fig. 10.—Six gall-stones.

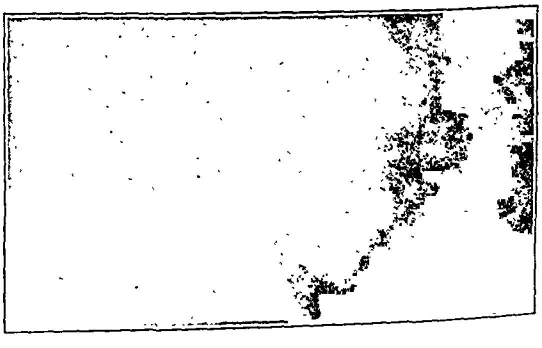

Fig. 11—Six gall-stones.

As before remarked, in a thousand patients referrred for gastro-intestinal disorders, I have demonstrated gall-stones by means of roentgenoscopy in almost 5 per cent. I believe I am safe in the opinion that, when gall-stones are present, they may be demonstrated by this means in 40 or 50 per cent. of cases. A negative opinion as to the presence of gall-stones following the Roentgen examination, of course, does not rule them out, but they are demonstrated with such great frequency that it is distinctly worth while to search for them in every suspected case. This is certainly a larger percentage of gall-stones relatively impermeable to the Roentgen ray than would be expected from our previous conception of the visibility of gall-stones. Pfahler's experience in the roentgenographic search for gall-stones has been equally encouraging.

The increase in the number of cases in which gall-stones have been demonstrated by roentgenoscopy may be explained as follows:

1. Roentgenographic technic of to-day has made great advance, especially with reference to soft tissue detail. This is especially noticeable when intensifying screens are used, although in some instances, a clearer outline of gall-stones has been obtained on ordinary plates made without screen.

2. During a bismuth meal examination, the plate is usually anterior to the body and the tube behind, thus bringing the gall-stones nearer the plate on which their shadow is thrown and thereby increasing the probability of the shadow being recognized. On the other hand, during the usual examination for urinary stone, the plate is placed posteriorly, the tube being in front. In a number of instances it has been impossible to record a recognizable shadow of gall-stones on the plate made in a position for kidney examination, although on the plate placed anteriorly, the shadow was definitely seen.

3. One of the chief reasons for the more frequent discovery of gall-stones, roentgenographically, has been the fact that it has been considered distinctly worth while to look for them, and all plates of the hepatic region are most carefully scrutinized for any suspicious shadows.

4. Recent investigations have shown that it is rare to find stones composed of pure cholesterin on the one hand or of pure pigment salts on the other. The cholesterin stones "nearly always contain some pigment," most likely a calcium salt, and although nearly all gall-stones contain a good deal of cholesterin, calcium salts or bile pigments may be said to be almost invariably present. In the opinion of Dr. Williams,[1] calcium carbonate will be shown to be present much more frequently than has hitherto been thought. Dr. Williams concludes that "for a fuller understanding of the clinical aspect of gall-stones, the usually accepted classification of single cholesterin stones and multiple pigment stones needs considerable modification."

Suspicious shadows, when found, must be identified by various maneuvers to differentiate gall-stones from the various shadows with which they may be confused. Suspicious right upper quadrant shadows most likely to be confused with gall-stone shadows are those due to

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[1] Williams, O. T.: Quoted by Dr. Thurston Holland; Arch. Roentg. Ray, March, 1913.

(1) calcareous deposits in the costal cartilages; (2) renal calculi; (3) calcareous deposits in a tuberculous kidney; (4) calcified mesenteric lymph-nodes.

Calcareous deposits in the costal arch are easily identified in stereoscopic plates as they are also easily recognizable in plates made postero-anteriorly.

Kidney stones may be identified by their clean-cut edges, their immobility, the homogeneous nature of the shadow and the fact that the shadow of the stone shows within the shadow of the kidney, although several plates may be made in different directions. A comparison of the exact size of the shadows made on two plates, one made anteroposteriorly and one made postero-anteriorly, shows that the shadow of the gall-stone is usually more clean-cut and distinct and somewhat smaller in the latter than in the former.

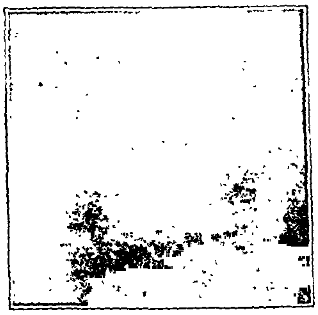
Fig. 12.—A single gall-stone.

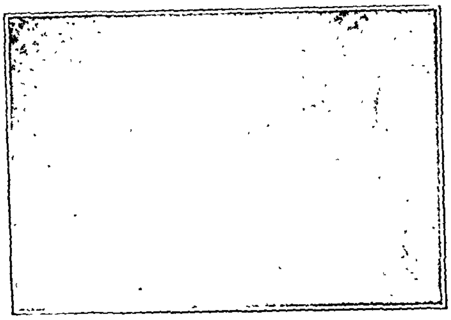
Fig. 13.—Ten gall-stones. This case illustrates the necessity of differentiating from renal calculi, for here the gall-stone shadows are superimposed on the *well-defined shadow* of the right kidney. Roentgenograms made obliquely or stereoscopically are needed.

Pyelography is likely to be of special use in differentiating renal shadows. The shadow of the renal pelvis and the suspected shadow may coincide and several plates at varying angles should be made or else stereoroentgenograms secured, showing that the suspected shadow really rests an inch or more anterior to the renal pelvis shadow. Stereoscopic plates of the renal and gall-bladder region may alone suffice to identify shadows either biliary or renal. E. W. Caldwell was probably the first to apply the stereoscopic method to the identification and differentiation of suspicious shadows in the region of the kidney.

Calcareous lymph-nodes are fairly common, but, as a rule, cast a very characteristic shadow, irregular, the edges being indistinctly outlined, with here and there areas of greater density, giving more or less of a mulberry appearance to the shadow. Calcareous lymph-nodes are frequently multiple and may be demonstrated to be perfectly freely movable by manipulation under the fluorescent screen, or by making plates with varying pressure applied in different ways on the abdomen.

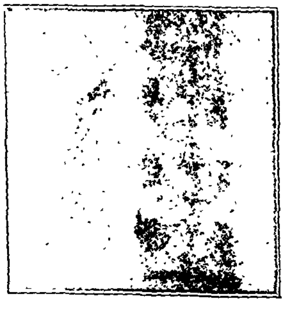
Fig. 14.—More than seventy gall-stones. One in the common duct.

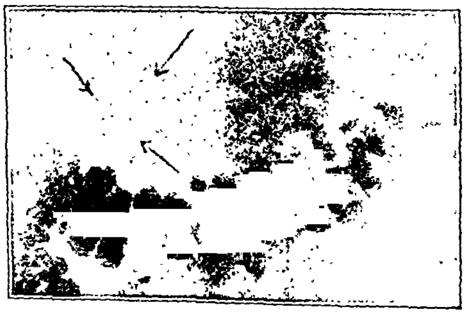
Fig. 15.—Twenty-seven gall-stones.

Identification of hepatic or common duct stones by means of the Roentgen ray has been successfully accomplished by Beck and Pfahler, at least, and perhaps others. I have had one remarkable case of common duct stone successfully demonstrated roentgenographically (Fig. 14).

Many gall-bladder region shadows have characteristic markings which serve to identify them as gall-stones. In visible gall-stones, the calcareous deposits are arranged in strata, usually a calcareous deposit on the exterior, the center being less opaque. The stone thus may present a definite capsule-like circumference. Many gall-stones show facets; others are uniformly opaque. In stereoroentgenograms of the abdomen, the gall-bladder shadows are seen to lie in a plane considerably anterior to the position of the vertebrae and considerably anterior to the outline of the kidney itself. This conception may be further corrected and verified by stereoroentgenograms following the injection of collargol or a catheter into the pelvis of the kidney. It is also likely that stereoroentgenograms following the ingestion of a bismuth meal will show the relation of the suspected shadow to the pyloroduodenal shadow in a manner further serving to identify this shadow as gall-stone.

Under the fluorescent screen, one may often very satisfactorily study the relation of the suspicious shadow to a point of pain on pressure under the right costal arch. Of particular value is palpation following the bismuth meal, when one may find that there is definite localized pain on pressure at a point to the outer side of the duodenal shadow, moving up and down during respiration, whereas on accurate palpation on the gastric side of the duodenal bulb, no pain at all may be present.

Even if no suspicious shadows be present, a number of Roentgen-ray findings following a bismuth meal are of assistance in the diagnosis of gall-bladder disease, with or without stone, namely:

1. Hepatofixation of the stomach, the pyloric region being drawn to the right and upward in a significant manner. Pfahler called attention to this sign two years ago. These adhesions rarely produce delayed emptying of the stomach.

2. A definitely tender spot of pain on pressure accurately localized to the outer side of the shadow of the duodenum. If the duodenal shadow is not sufficiently dense, it may be rendered so by the simple expedient of having the patient lie on the right side for a few moments, and then asking him to turn on the back while holding a full breath. The screen having been in readiness, the current is started, and fluoroscopic study made at once while the pyloroduodenal region is well seen. Or with the palpating hand or a wooden spoon, some of the contents of the stomach can be forced out through the pylorus into the duodenum. It is a characteristic of such cases that there is a lag in the emptying of the duodenum.

3. The presence of Riedel's lobe of the liver, when demonstrable following gas distention of the stomach and colon, is another contributory sign of gall-bladder disease. Particularly in cases of suspected gall-bladder

disease, in which jaundice is not present this sign may be of special value. In several instances I have seen a rounded, localized enlargement on the inferior border of the liver, which proved to be an enlarged gall-bladder.

4. The hepatic flexure of the colon may occupy an unusually high position, a further suggestion of gall-bladder disease.

5. The emptying time of the stomach following a bismuth test-meal is usually much shortened, and the outline of the duodenum is well seen owing to a delay in the emptying time of the duodenum or to a too rapid outpouring of the stomach contents through the duodenum. It was formerly supposed that this unusual visibility of the duodenum strongly suggested duodenal ulcer, but in my experience it may occur in any duodenal affection or in gall-bladder disease.

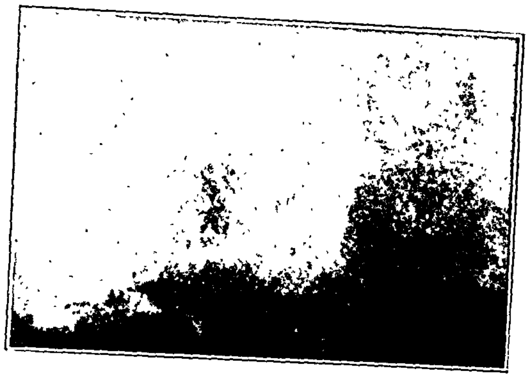
Fig. 16.—Multiple gall-stones.

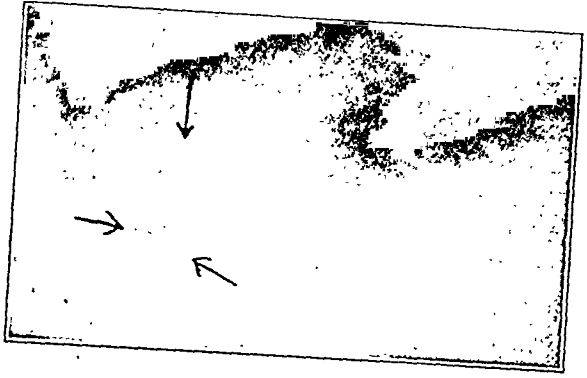
Fig. 17.—Multiple gall-stones.

6. In a number of cases I have observed a spastic manifestation in the stomach, sometimes a spastic indrawing on the greater curvature high up near the cardia and at other times a complete spasm of the pylorus as an associated sign of gall-bladder disease. The same sign has also been seen in duodenal ulcer, tabes, hysteria, appendix disease and even in hyperthyroidism.

7. In a few cases, very abnormal disposition of the sigmoid flexure of the colon has led to a diagnosis of gall-bladder disease. The roentgenographic demonstration of aberrancies of the sigmoid colon has been discussed by Pfahler, myself, and various others. The sigmoid may be procolic or retrocolic. In one remarkable instance, the aberrant retrocecal loop measured 54 inches from the iliopelvic junction to the rectum and was adherent every inch of the way, including adhesions to the duodenum and the stone-filled gall-bladder.

ABSTRACT OF DISCUSSION

Dr. Lewis Gregory Cole, New York: It is generally believed by the roentgenologist as well as by the profession at large that gall-stones do not show in the roentgenogram. The reason for this, I think, is largely, as Dr. Case stated, that we do not search for them as we should. I do not think that I could take exception to a single thing that Dr. Case said in his paper, except about the possibility of showing the sulci between the lobes of the liver. During the past six months I have found more gall-stones than kidney-stones, simply because I looked for them. They have to be differentiated. You cannot make a definite negative diagnosis, but you can make a definite positive diagnosis.

Dr. George Pfahler, Philadelphia: I believe that in 50 per cent. of these cases gall-stones can be demonstrated, and whether or not they throw a shadow depends on their composition. If they contain lime salts, they can be demonstrated. The kind Dr. Case showed were of that composition. In fact, gall-stones can practically all be demonstrated. Occasionally I can show a stone consisting almost entirely of pure cholesterin. A case of that kind was referred to me. The patient was passing blood in the urine and was extremely tender over the gall-bladder. In that case I found faint abnormal shadows near the common duct in two plates. I made a diagnosis of stone in the common duct and at the operation that diagnosis was confirmed. The stone was removed, and this shows that we can often go beyond the group to which Dr. Case referred. Such stones cannot be demonstrated by lantern-slides; but only by proper illumination and by one who is an expert in reading these negatives. They can also be demonstrated by a technic I described two years ago before the American Roentgen-Ray Society, namely, by bending the body strongly to the left. I wish to refer to a case in which such studies were most important to a patient suffering from severe pain in the right side for eight years. The appendix was removed, but the pains continued, and it was finally concluded that the pains were due simply to a desire to have morphin. A diagnosis of malingering was made. A careful study of the kidney showed no stone, but an examination of the gall-bladder region showed that the gall-bladder was filled with stones. Dr. Laplace removed 196 small, sharp-cornered stones. Every time one of these stones passed the patient had a severe colic. These are only a few examples of cases in which the practical application of this method will often keep us from making a faulty diagnosis.

Dr. A. D. Bevan, Chicago: I have followed this subject rather closely for a number of years. In 1898, when the early work was being done with the Roentgen ray to determine the position of kidney-stones, we did some experimental work to find what evidence we could obtain in cases of gall-stone disease. Our results were interesting. We took a series of stones, no matter of what composition, and put them in a large beef liver. Then we made a roentgenogram to find what stones gave a shadow and what stones did not. As has been very well stated here this afternoon, the presence or absence of a shadow depends entirely on the composition of the stone. We found that the pure cholesterin stones did not show any shadow at all. The stones that contained carbonated calcium gave a good shadow. Some stones did not cast as much shadow as normal salt solution. In looking over this evidence we must ask ourselves as practical surgeons of how much value this work is. I think it is of comparatively little value. The time has not arrived when the Roentgen ray is of any great value in making a diagnosis of gall-stone disease. The men who are doing a great deal of roentgenographic work encounter many cases in which they find this evidence. They are not surgeons, and therefore they come to the conclusion that this would be of value in a given number of cases. To the surgeon, on the other hand, who is operating on hundreds of cases of gall-stone disease, this means of diagnosis would not be of much value. I do not believe that it would be a help in more than one case in ten. I want to emphasize that point. In one case, for instance, the evidence was very confusing. The

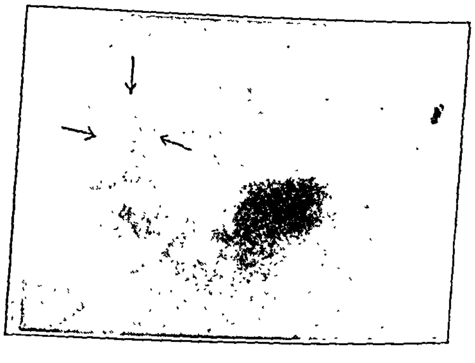
Fig. 18.—Multiple gall-stones.

clinical history was that of a typical common-duct case. The roentgenogram showed a definite stone in the position of the common duct. The operation showed that the stone was there. It was removed from the common duct. The conclusion was definite and absolute. You would hang a man on evidence of that kind. I placed that stone in some urine and found that it floated. It was a light stone. I took another picture of that patient and found the same shadow in the same place. It was a silent kidney-stone. I wish to emphasize the fact that the evidence given by the roentgenogram in determining the presence or absence of gall-stones is of very little value.

Dr. J. T. Case, Battle Creek, Mich.: In the part of the paper which I did not read I described Dr. Pfahler's technic to assist in the demonstration of gall-stones. Dr. Bevan's remarks are timely and should serve to repress youthful enthusiasm, but I should like to call your attention to a few facts. Among the last one thousand cases of bismuth-meal examinations made in my clinic for conditions such as gall-bladder disease, ulcer and carcinoma of the stomach, intestinal trouble, appendicitis and all kinds of abdominal conditions, I have demonstrated gall-stones in forty-eight. If only one-tenth of these cases can be diagnosed by the Roentgen ray, there were 480 cases of gall-stones among one thousand cases, and yet none of these cases were suspected clinically. I believe that the percentage—one in ten—is too high.

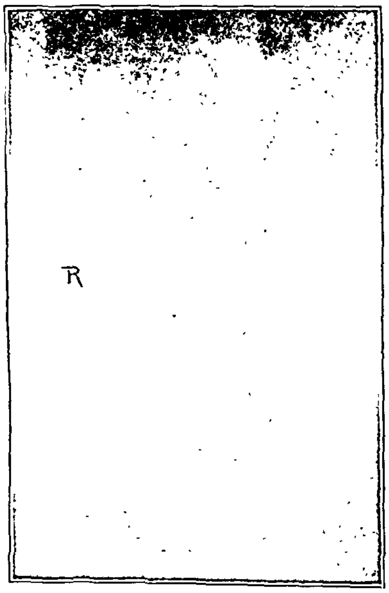

Fig. 1.—Series of normal kidneys. J. E., male, Case 2. Catheter on left side follows roof of pelvis as in 80 per cent. of our cases. Note shadow of both kidneys.

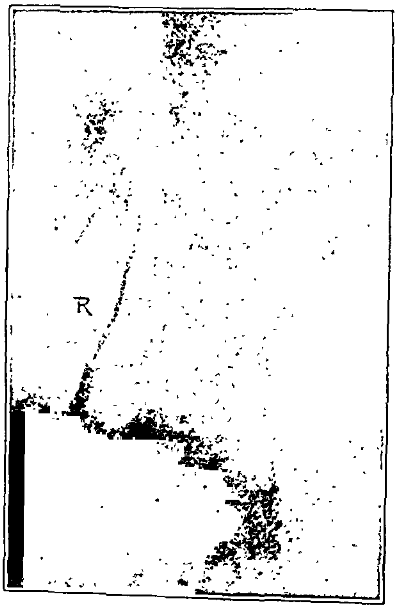

Fig. 2. — Series of normal kidneys. Miss L. P., Case 9. Bifid pelves with sharp kinks in each ureter. Note the presence of the collargol in the collecting tubules.

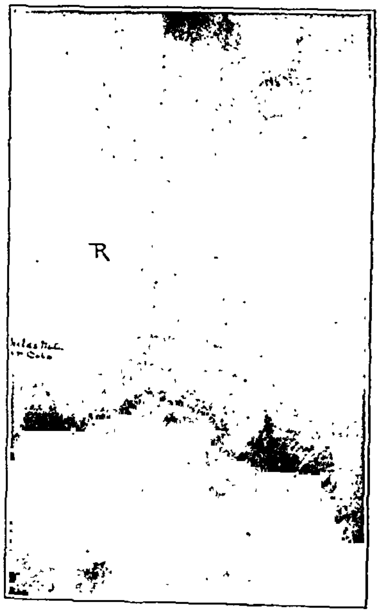

Fig. 3.—Series of normal kidneys. Mrs. B. F., Case 10. Note bell shape of right pelvis and sharp kink in right ureter shortly below uretero-pelvic junction. Note also wide ribbon-like appearance of ureters.

ROENTGENOGRAPHIC STUDY OF THE NORMAL KIDNEY, ITS PELVIS AND URETER*

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DENVER

From our text-books on anatomy and from the dissecting-room we have learned the normal size, shape and position of the kidneys, and their pelves and ureters in the cadaver. When we try from roentgenograms to draw correct conclusions as to the size, position and contents of the pelves, calyces and ureters, or the difference in position of the kidneys and ureters in the prone and upright positions, we find such a diversity of opinion concerning the normal or abnormal conditions existing that we think it worth while to undertake the roentgenographic study of the normal kidney, its pelvis and ureter in the living subject. We hope thereby to fix a reliable standard for ourselves, so that deductions and diagnoses from our cases in this most important field may be found reliable and accurate, whether confirmed at operation or by the subsequent course of the case.

The normality of our cases was determined as follows: The history was carefully taken, and if anything was found to indicate previous or present kidney or ureteral lesions, the case was dropped. The clinical history being negative, the bladder urine was drawn and examined. If normal, the case was accepted for roentgenographic study. If abnormal, and we suspected that the condition was due to some abnormality in the lower urinary tract, the ureters were catheterized; if it was found that all the trouble existed below the lower ureteral orifices, the case was accepted and roentgenographic study of the kidneys and ureters undertaken. If any abnormal conditions were detected through this study, the case was thrown out of the series. Thus we did a great deal of work, and have but ten cases to report, with, of course, twenty normal kidneys. Previously we had formed certain ideas from the plates of a presumably normal kidney taken to show some pathologic condition of the opposite kidney. We have not included a study of these normal kidneys in this series because these cases could not meet the requirements demanded by us as to history, clinical findings, clean urine, etc.

The technic followed is here described: Roentgenographic catheters are passed into the ureters as far as possible. When they come to a stop in the kidney pelvis, collargol is injected by measured gravity pressure. We have used for this purpose an apparatus consisting of two 50 c.c. burets, ⅜ inch inside diameter, for the collargol, which is connected by rubber tubing of smaller diameter with a needle small enough to enter any size urethral catheter. This idea was adopted from Braasch's apparatus. We have added thereto an irrigating jar on the same stand for the purpose of supplying water for our cystoscopic examination. This apparatus is so raised that the bottoms of the burets are less than 2 feet above the level of the patient's body. We believe that this furnishes us with a comparatively slow flow of collargol into the kidney pelvis without much pressure. We do not cease injecting collargol into the pelvis until pain is positive on both sides, as we have found that the subsequent readings and interpretations of our plates are unsatisfactory if the pelves are not filled, and there is no way of determining this fact until pain is complained of. One of our cases, in which we stopped the flow of collargol before the appearance of pain, demonstrates that an interpretation of the plate is unsatisfactory when distention of the pelves has not been obtained.

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* Read in the Section on Genito-Urinary Diseases of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

On the appearance of pain, however, the flow of collargol is immediately stopped. From this point we have varied our technic, depending on whether we wanted to show the ureters, their shapes and angulations, or whether we desired to show where catheters go in normal pelves, either by partially withdrawing our catheters or by leaving them *in situ*. We have never, following this plan, used less than 4.5 or more than 15 c.c. in a pelvis. The percentages of collargol that we used varied from 8 to 20 c.c., depending on the stoutness of the patient, and we have found no more disturbance or pain with the high percentage than with the low, and have decided that pain, shock and subsequent temperature are caused chiefly by distention.

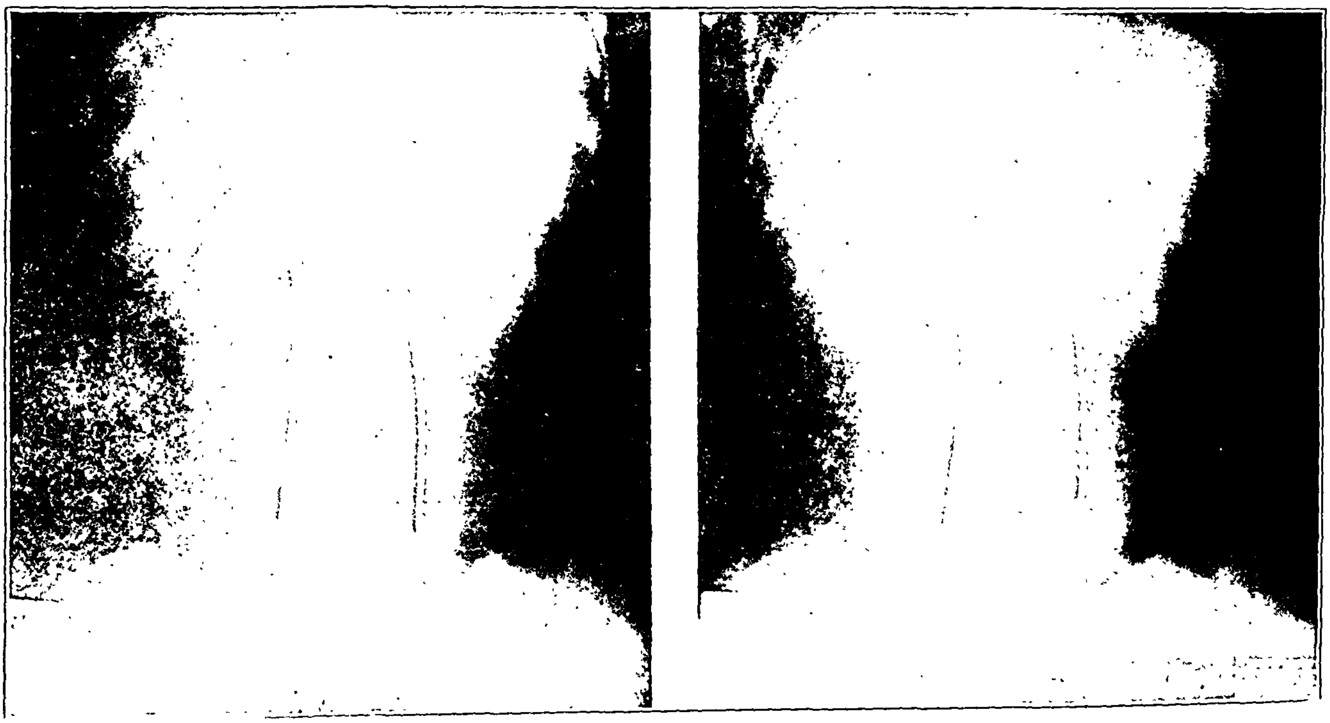


Fig. 4.—Series of normal kidneys. Miss R. B., Case 7. This may be cut out, pasted on a piece of cardboard, and the stereoscopic effect obtained with an ordinary parlor stereoscope.

The fact that injection should cease immediately on the appearance of pain is demonstrated by Case 9 in the accompanying table, in which, although we used no more pressure than for the others, we permitted the flow of collargol for a short time after the patient complained of pain, and the tubules on the plate resembled the branches of a delicate fern. This patient suffered with some pain, and had a temperature, varying from 99 to 101 for two weeks afterward, and the collargol was not completely swept out for about this length of time.

In the literature on this subject the report of a case appeared in which the collargol ruptured the parenchyma of the kidney, and appeared under the true capsule. One would infer either that there was undue pressure from a hand-syringe (whose pressure cannot be gauged) or an unduly long-continued flow under pressure. We wish to remark in passing that this work should be done only by men who are trained in it.

The stereoscopic plates are made with intensifying screens, the anode of the tube at least 26 inches from the plate. The tube is focused about the level of the third lumbar vertebra. Care has been exercised in our work to take all plates at the same point of respiration, that is, the breath held at the end of a deep inspiration. This is true of the plates taken in the recumbent and the standing postures. By this means we have been able to determine the mobility of the kidney over and above that produced by respiration. We have not tried to ascertain the amount of movement of the kidneys in respiration, and on the other hand, we have eliminated this feature from our series by the precautions just mentioned. A slight respiratory movement, while the plate is being taken, gives a hazy or double outline of the collargol-filled pelvis and ureter, and hence it is necessary that respiration cease entirely for the extremely short time required to take the plate.

The apparatus used was the Scheidel-Western transformer, first inductance tube drawing 35 to 40 milliamperes, exposure from three-fourths of a second to one and one-half seconds, depending on the weight of the patient.

We had found in our previous work that without stereoscopic plates we were unable to differentiate between kinks and curves of the ureters, and the course of the ureter was a matter of guess-work. We also found it difficult to know the relative position of calyces and of shadows connected with the kidney pelvis. With stereoscopic plates the relative position of the structures is apparent, and this is important.

We have found that generally we can show the kidney itself in the roentgenogram. It is obscured, of course, on occasions, by gas, but when this is not so it shows distinctly. We believe that it is of value to have the kidney itself appear on the plate because one can exclude a growth in or near this organ, judging from its size, shape and position, if it be clearly shown. We have failed to detect anything new in our study of the size and shape of the kidney. In the table it will be seen that the position of the normal kidney varies markedly. Some of these kidneys are to be found very high, and some very low. *One of the kidneys in Case 3*, although normal, is no doubt dystopic. The mobility, varying from nothing to 3.5 cm., as shown in the table, is determined by comparison between plates taken in the recumbent and the standing positions. After the patient was removed from the table and placed in a standing position he was asked to cough and make other forced respiratory efforts, and to raise his heels from the ground and come down forcibly. The change in position also intensified angulations of the ureters. Attention is called to the fact that in one case the kidney is actually in a slightly higher position when the patient is standing than when lying down, owing possibly to a change of focal point.

In our series we find that the capacity of the normal pelvis varies, as before stated, from 4.5 to 15 c.c., and we also find that the apparent size on the plate occasionally seems incompatible with the real capacity. When there is a single pelvis it seems to be always of the same shape, that is, convex on its upper border, concave on its lower, and points toward the spinal column, its axis being either horizontal or slanting slightly downward and forward to the ureteropelvic junction. The course of the ureter is never constant and the shape seems to be dependent on peristalsis to a great degree. Its extreme mobility and its loose connection with neighboring tissues are easily shown in the stereoscopic plates by the position it is forced into by the catheter, when the catheter is carried to the end of a calyx and meets with slight resistance.

Its length has been estimated as follows: At the time of examination, the distance that the roentgenographic catheter passes into the ureter is noted, and on the plate the distance from the ureteropelvic junction to the terminal end of the catheter is computed and subtracted from the total number of centimeters that the catheter passed out of sight into the ureter, thereby giving the approximately true length of the ureter. The distance the catheter disappeared into the ureter, heretofore, has been considered the ureteral length. It must be apparent, from our plates, however, that this is inexact, as variable amounts of catheter may be contained in the pelvis itself. The ureteral length is of importance, as by this means a dystopic kidney may be proved, in conjunction with roentgenographic work. If the ureteral catheter disappeared but 15 or 20 cm. into the ureter and was then brought to a halt, this would be of no value without the accompanying plates to demonstrate that the catheter was not brought to a halt somewhere in the course of the ureter by a stricture or bend, instead of being in the pelvis. For many other reasons it is well to know the ureteral length. This is but one of the many places in which it is shown that the urologist must always work with the roentgenologist to draw conclusions in these cases. We are convinced and feel with the rest of the urologic world that diagnoses are difficult enough to make under proper conditions, even with all the aid at our command, and are satisfied that as the worker employs more and more means and methods to draw his conclusions, his deductions, in proportion, will be more exact.

We have encountered but two main types of pelves, the single and the double pelvis as described by others. In Case 9 there are double pelves on both sides, in all the rest of the cases in this series there being single pelves. We find, if it be of any importance—although we cannot conceive why it should be—that the number of calices majores shown on the plates varies from three to six. Another observation, and one which we think is of value, is that the catheter, as a rule, in the normal kidney follows the superior or convex wall of the pelvis. This is due to the fact that the catheter has a tendency to travel in a straight line, is deflected by this wall and continues in contact with it until it enters a calyx. For the same reason, but not so frequently, the catheter travels into the superior oblique calyx, if we might so name it; or if there be no superior oblique calyx, it travels into the superior calyx. If the kidney pelvis were large and the calyces wide, no doubt the catheter would take a different direction and coil up in the pelvis or pass to a lower calyx, as we have occasionally seen.

Anatomists have described the kidney pelvis as a dilated portion of the ureter and have also described other dilatations and constrictions below the pelvis. They also inform us that the angulations exist in the ureter, normally, and tell us that the ureter is further constricted by structures outside of it, such as the spermatic artery, which crosses the ureter about the middle of its course; but we do not know, from observations made by others, how these normal kinks, constrictions and dilatations should appear in roentgenograms, and because of frequent peristalsis in the ureter we are not prepared to say whether all these constrictions actually exist or are caused by peristalsis; but we have repeatedly demonstrated that kinks, angulations and constrictions are common in normal cases. We believe that we have overcome the peristalsis of the kidney pelvis, a muscular structure, by maintaining the pressure of collargol while the plate is being taken. We accomplished this by having the end of the catheter still connected with the needle and tube which furnished the collargol, although the flow was shut off with a stop-cock. While no more collargol could flow in, in the majority of our cases none flowed out, as verified by cystoscopy. In measuring the capacity of the kidney pelvis, one must take into consideration that frequently quite a quantity of collargol flows into the ureter without appearing in the bladder, as in Case 10, and that this is generally estimated in the pelvic contents. We have found this filling of the ureters occurs most frequently in women who have borne children, and whose ureters appears to be large and lax. This condition can only be determined on the inspection of the roentgenogram.

Lastly, we come to the question of whether or not pyelography is justifiable, in view of its alleged seriousness. We are decidedly of the opinion that it is, because differential diagnosis between abdominal conditions and kidney and ureteral conditions have been made possible by this means, whereas heretofore medicine and surgery were held back because of the inability of the surgeon to differentiate between abdominal and pelvic conditions on the one hand, and kidney and ureteral conditions on the other. Despite the fact that we have had pain, shock or high temperature, or any combination of these, follow our investigations, all in moderation and all transitory, we feel sure that we have done no permanent injury either in this series or in any of our pathologic cases.

We would suggest that immediately following the work a hypodermic of morphin and a large quantity of water with some whisky be given the patients, the first of which will completely control the pain, and the latter produce a polyuria for the purpose of washing out the collargol which remains in the pelvis. We see no use in attempting to syphon the collargol from the kidney pelvis by leaving the catheter *in situ*, as we feel sure that the sooner the catheters are withdrawn the sooner will there be room for the fluid to leave the pelvis.

CONCLUSIONS

1. Pyelography is not only justifiable, but is necessary; however none but the trained urologist should attempt it.

2. Unless the lower border of the pelvis is concave, we consider it abnormal.

3. A pelvic content of over 15 c.c. should be viewed with suspicion and investigated further before its normality is accepted.

4. Movement of the kidney of from 1 to 3.5 cm. over and above the physiologic (respiratory) movement is normal.

5. The ureteral catheter, as a rule, enters the upper oblique calix and follows the roof of the kidney pelvis to do so, in a normal case.

6. Angulations, curves and kinks of the ureter are found in normal persons.

7. Stereoscopic plates are not only necessary, but imperative, to demonstrate intrapelvic and extrapelvic conditions, and the course and kinks of the ureter.

8. Length of ureter can be calculated only from the plate, and is of importance.

9. Pain, shock and subsequent temperature are caused by rapid distention of the kidney pelvis rather than by any particular drug or percentage of drug that is used, and are unavoidable, if one properly fills the pelvis for diagnosis, although none of these disagreeable sequelae need be produced to an extreme degree or cause much disturbance, and can be obviated to a great degree.

10. As the shape of the ureter is due to its laxity or tenseness, either of which conditions may be normal, and its caliber varies considerably in normal subjects, and as it is still further altered by peristalsis, care should be exercised in drawing conclusions that pathologic conditions exist because of apparent abnormalities of shape and course, or because of curves, kinks and angulations, or apparent constrictions.

Metropolitan Building.

ROENTGENOGRAPHIC STUDY OF THE NORMAL KIDNEY

Right Kidney

Case	Position Mid. Pelvis, Recumbent	Position Mid. Pelvis Standing	Total Movement. Respir'y Movement Excluded, Cm.	Shape and Type of Pelvis	Length of Ureter, Cm.	Capacity of Pelvis, c.c.	Number of Calices Majores	Kinks and Angulations of Ureters	Position of Catheter in Pelvis
1. J. D. M., M...	Upper border of third lumbar	Transverse process third lumbar	1	Single, nearly quadrilateral	34	6.5	5	None	Upper oblique calix
2. J. E., M......	Transverse process second lumbar	Upper part of body of second lumbar	1	Single, pear-shaped	?	7.5	4	12.5 cm. from bladder	Not examined for
3. C. T., M......	Opposite transverse process fourth lumbar	Between bodies of third and fourth lumbar	—1.5	Single, nearly pear-shaped. Almost quadrilateral	32	11	3	None	In upper calix
4. C. G., M.....	Lower part of body of second lumbar	Opposite lower part of body of second lumbar	0	Single. Pear-shaped	33	4.5	4	None	Upper oblique calix, passing along roof of pelvis
5 E. N., M......	Interspace between second and third lumbar	Interspace between second and third lumbar	0	Single. Pear-shaped	30	7.5	4	Angulation in lower portion	Follows roof to lowest calix
6. M. W., F.....	Upper half of body of third lumbar	Interspace between third and fourth lumbar	2.5	Single. Pear-shaped	30	8	3	None	Upper calix, followed roof of pelvis
7. R. B., F......	Opposite interspace between first and second lumbar	Opposite upper part of the body of second lumbar	1	Single. Pear-shaped	29	6	3	None	Upper oblique calix
8. E. T., F......	Opposite upper border of third lumbar	At the level of transverse process of third lumbar	2	?	?	*	?	Slight angulations	Not inserted into pelvis
9. L. P., F......	Opposite transverse process second lumbar	Opposite transverse process second lumbar	0	Double	?	5.5	..	Double kink below ureteropelvic junction	Not examined for
10 B. F., F.......	Opposite upper half body of second lumbar	Lower border of third lumbar	3.5	Single. Bell-shaped	?	†	2	1 cm. below ureteropelvic junction. Sharp and double	Not examined for

* Measured quantity injected, 7 c.c.

† Perhaps 12 to 14; had to be estimated.

ABSTRACT OF DISCUSSION

Dr. O. S. Fowler, Denver: I have found that it is not necessary to produce pain in order to get a satisfactory roentgenogram. Furthermore, I think it extremely inadvisable to inject enough to produce pain, for the reason that one may inject the kidney tubules, or go even farther than that. A few cases have been reported in which the kidney substance was ruptured with the production of an infarct. Therefore, I feel that it is extremely undesirable to produce pain, and I try to obviate it as far as possible. I consider it unimportant to determine the length of the ureter; in fact, you cannot determine the length by the insertion of the catheter. The catheter may meet an obstruction at 20 or 30 cm. or even farther, if you pass it up into a hydronephrotic pelvis. You cannot determine anything of value, therefore, by the distance you have inserted the catheter. If you meet an obstruction you had better stop there.

We would naturally expect the catheter to follow the upper surface, because that is the concave surface, and we would naturally expect it to follow the upper wall and to go into the upper calices. If you get it into the upper calyx and then keep pushing it in, it ought to curl up in the kidney pelvis.

The ureteral catheter smooths out all the angulations of the ureter when the patient is lying down. We do not have much trouble with the kidneys in patients when lying down. We want to see what these kidneys look like under normal conditions—fluid conditions—of the urinary tract. That is what the patient has to deal with every day of his life, and what is the object of putting in the catheter and trying to show something when the patient has the catheter in there! What we want to know is, is there any difficulty there under fluid conditions of the urinary tract? There may be anatomic deviations from a straight ureter. They may appear roentgenographically as though there were a kink. There are degrees of angulation and curving in these cases, and unless an angulation or curve is giving trouble, I say let it alone. It might give trouble in the future. I consider a kidney normal that is not producing symptoms, or if an obstruction cannot be demonstrated to which those symptoms can be referred. If you can demonstrate some other lesion to which these symptoms can be referred and cannot demonstrate something in the pelvis or ureter, then you should exclude the ureter.

Dr. W. F. Braasch, Rochester, Minn.: I do not think that it is necessary to cause any pain in order to make a good pyelogram. The pelvis is best injected by the gravity method, that is, by raising the silver solution above the level of the patient. Pain is not necessarily caused in that way, even though the pelvis is completely filled. Pyelography has been

ROENTGENOGRAPHIC STUDY OF THE NORMAL KIDNEY (Continued)

Left Kidney

Position Mid. Pelvis Recumbent	Position Mid. Pelvis Standing	Total Movement. Resp'r'y Movement Excluded. Cm.	Shape and Type of Pelvis	Length of Ureter, Cm.	Capacity of Pelvis, c.c.	Number of Calices Majores	Kinks and Angulations of Ureters	Position of Catheter in Pelvis	Remarks
Upper part of body of second lumbar	Transverse process second lumbar	1	Single, nearly pear-shaped	36	7	6	Catheter arrested below ureteropelvic junction. Intensified in standing plate	To kink 1 cm. below ureteropelvic junction	Right ureter markedly bowed forward by catheter pushing into calix. Air in bladder showing in standing plate. Left ureter dilated and constricted.
Transverse process first lumbar	Upper part of body of second lumbar	2.5	Single, pear-shaped	35	7	5	None	Upper oblique calix, following roof of pelvis	Obstruction met to right catheter at 12.5 cm. Impossible to pass this catheter further. Plate shows kink at this spot.
Opposite transverse process second lumbar	Opposite upper part of body of second lumbar	1	Single, pear-shaped	17	11.5	4	None	Upper calix, but follows floor to outer margin of pelvis	Dystopic kidney on right. Place where ureter enters dystopic kidney is on top of pelvis.
Lower part of body of second lumbar	Opposite lower part of body of second lumbar	0	Single, pear-shaped	35	8	3	Below ureteropelvic junction	Upper oblique calix, passing along roof of pelvis	Ureters demonstrate well their mobility in recumbent position, and are wavy and loose, and angulated in standing, although kidneys are high and immobile.
Lower part of body of second lumbar	Lower part of body of second lumbar	0	Single, pear-shaped	32	8.5	4	Angulation in lower portion	Follows roof to superior oblique calix	Ureters unusually straight and not loose.
Lower half of body of second lumbar	Interspace between third and fourth lumbar	3	Single, pear-shaped	31.5	7.5	3	None	Into upper calix. Has followed floor instead of roof of pelvis	Ureters not very loose.
Opposite body first lumbar	Interspace between first and second lumbar	1	Single, pear-shaped	28	5.5	4	None	?	Right pelvis is horizontal to vertical plane of body.
Opposite upper part of body of second lumbar	At the level of transverse process of second lumbar	2	?	?	‡	?	Marked angulations with pinching out of collargol in two spots	Not inserted into pelvis	Imperfect technic. Roentgenographic examination avails nothing. Note shape of ureter.
Opposite transverse process second lumbar	Opposite transverse process second lumbar	0	Double	?	6	..	Double kink below ureteropelvic junction. Sharpest kind of angulations	Not examined for	Obstruction met, but passed at site of kink on each side. Collargol pinches at both kinks in left. Constrictions and dilatations of left ureter.
Transverse process first lumbar	Transverse process second lumbar	3.5	Single, quadrilateral	?	§	3	None	Not examined *for*	Kink accentuated in standing *plate*. Upper calix of left kidney has emptied in standing plate, and its position is indicated by shadow resembling gas. Same occurs in one other plate.

‡ Measured quantity injected, 7 c.c.
§ Perhaps 12; not accurate; had to be estimated.

severely criticized for being the cause of severe pain, most of which could have been *obviated if the proper technic* had been employed.

Dr. W. M. Spitzer, Denver, Colo.: I have used in these cases, as in all our pathologic cases, the gravity method. When I spoke of causing pain, I did not mean excessive pain or pain which lasts a long time; but we do cause pain, and we do not stop until we get to the point of pain. We use an apparatus such as Dr. Braasch uses, a 50 c.c. buret, raised two feet above the level of the patient. You will cause pain if you use a needle of fair-sized caliber and a good-sized catheter, whereas you will not cause pain with a small-sized needle, the difference being not so much in the amount of the solution used, as in the rapidity with which it is injected. When you have distention of the pelvis, whether it is caused by a stone blocking the ureter and thus damming back the urine, or by a fluid injected, you are going to cause some pain, and you cannot avoid it.

In answer to the remarks made by Dr. Fowler: I was not discussing the pathologic kidney. I was simply showing the normal kidney. We took great pains to assure ourselves that these kidneys were as normal as we can prove them to be at the present time. If the urine showed that the least thing was wrong with it, we threw the case out of our series. We took great pains in other ways to prove our cases normal. I do not think an exhibition of pathologic kidneys shows whether my cases were normal or not or concerns this work in any way. The object of the work was to attempt to show the normal. If other people will help to demonstrate the normal, we shall have, after a while, a basis from which to deduce the pathology. Simply to say, "Here is a case that is pathologic because I say so," seems to me foolish, and that is the reason that we have done this work. We have demonstrated kinks in 60 per cent. of the cases in which we sought them in this normal series.

To read something from a plate, I think we must have a kidney pelvis well dilated with collargol. I removed a kidney for a very evident tuberculosis. It had to be torn loose from everything around it. The case was diagnosed as a hydronephrosis and the patient was operated on because there was a kink in the ureter, which demonstrates that some of us cannot read the pathology shown in our pyelographs and justifies the study of the normal, as a basis for our deductions as to what is, and what is not, pathologic.

THE EXTERNAL BONE CLAMP VERSUS THE INTERNAL BONE PLATE IN THE OPERATIVE TREATMENT OF FRACTURES *

LEONARD FREEMAN, M.D.
DENVER

So much has been said recently about Lane's internal bone plates that there is danger of losing sight of the advantages of the external bone clamp. Hence a brief comparison of the two should be of interest.

In operating on fractures it is often necessary to employ some artificial means for holding the fragments in position. According to circumstances this may be done with chromic catgut, wire, bone or ivory ferrules or medullary plugs, autogenous or foreign bone grafts, staples, internal bone plates, or external clamps of various patterns.

The ideal method would consist in the use of something which, while holding the bones firmly and not irritating the tissues, would rapidly undergo absorption, thus leaving no foreign body to cause delayed union and late infection. It should also be easy of application, with the least traumatism, and should not interfere with the process of repair.

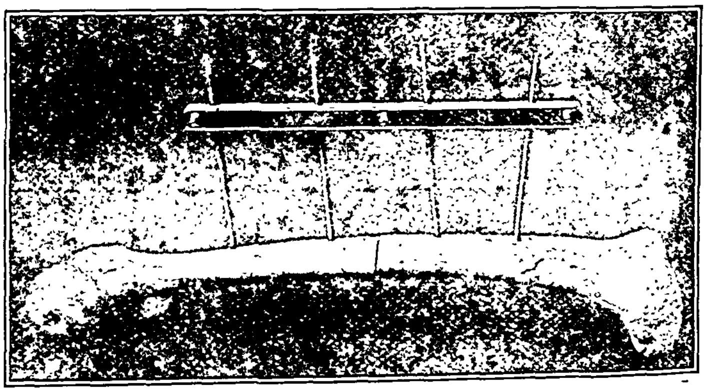
Unfortunately none of the procedures in use fulfil all of these requirements, although most of them answer sufficiently well in appropriate cases. At present the plate and the clamp are most in favor, although, in ununited fractures at least, the autogenous bone graft is rapidly gaining ground and may soon supplant both of them.

Great similarity exists between the internal plate and the external clamp. Both are fastened to the bone with the same number of screws, the only difference being that in one the part which unites them is outside the skin, while in the other it is beneath it. In fact, the clamp might be termed an external plate or the plate an internal clamp.

All external clamps have in common several screws, long enough to project well beyond the skin when they are inserted into the bone. The many varieties differ only in the mechanism by which the screws are held together.[1]

The advantages of the external clamp over the internal plate, in appropriate cases, are:

1. It can often be more easily applied, with less manipulation of the tissues and denudation of the bone. Holes can be drilled and the screws inserted with the fragments in almost any position. They can then be adjusted without the use of elaborate holding-apparatus and the screws instantly clamped (see illustration).



External bone clamp.

2. Nothing comes in contact with the line of fracture, as does an internal plate; and the screws themselves may be placed as far away from the break as may seem desirable—even in sound, uninjured tissues. This is of much importance, because, as is well known, the presence of a foreign body favors delayed or non-union, to say nothing of infection. In this connection Martin[2] says, "As a rule, the presence of a plate, instead of stimulating osteogenesis between the broken bone-ends, retards it." The possibility of placing the screws at a distance from the fracture is also of manifest advantage in cases in which the bone is comminuted.

3. In most instances an external clamp will immobilize the bone fragments even more firmly than an internal plate will, as may easily be demonstrated. This is because the long screws get a particularly firm grasp within the bone and the heavy external clamp holds them together with absolute security. The screws, if rigid enough, may be long without detriment, because they will be removed later; and the clamp may be heavy because it lies without the tissues. When a clamp is

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* Read in the Section on Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

[1] The external bone-clamp was introduced into this country and popularized by Clayton Parkhill of Denver.

[2] Martin: Surg., Gynec. and Obst., September, 1912.

properly inserted, say in a fracture of the tibia or of the femur, the limb may be picked up by the foot and thrown about in any direction without fear of disturbing the fracture; but if a plate is employed this can seldom be done without danger of bending or breaking it, or of pulling the screws from the bone.

4. The principal advantage of the external clamp, however, is that it may easily be removed at any time without the use of a general or even a local anesthetic, thus avoiding a much-dreaded secondary operation and also the necessity of leaving a foreign body in the tissues with all the disagreeable possibilities that this implies.

Every one knows that while plates are being inserted all over the country, they are constantly being taken out, either by those who put them in or by others. If this were all it would not be so bad; but, in addition, sepsis is not infrequent, sometimes resulting in loss of limb, as I have seen, or even in loss of life. In our Denver hospitals, which, I venture to say, compare favorably with most others, many plates have been inserted, the majority of which have had to be removed for various reasons, and some of the results have been disastrous in the extreme.

Let us now consider some of the disadvantages urged against the use of the external clamp:

1. Its size and weight. This objection is easily disposed of. The large and heavy portion, which insures security and strength, lies outside, where it is productive of neither inconvenience nor danger of any kind—a large instrument being tolerated by the patient as easily as a small one. The screws alone penetrate the tissues, and they are often of no greater diameter than those of an internal plate.

2. The most plausible objection to the external clamp is the supposed great danger of primary or secondary infection. This has been frequently and strongly urged, but, I am convinced, without adequate reason. The situation may be put in a few words: If the operation is a clean one primary infection will not occur with clamp or plate. If the operation is not clean, infection may take place with either; but its effects will be less severe with the clamp, because of drainage afforded by the external screw-holes. And on the side of the clamp lies also the great advantage that it may easily be removed at any time without a second operation.

If secondary infection occurs with the external clamp, it is late in appearing, trivial in amount and confined strictly to the screw holes, as has been amply proved by the experiences of Parkhill, Lambotte, myself and many others. In fact such localized, non-spreading, secondary infection may be compared to that which is seen around sutures of silkworm-gut, although infection is more likely to take place in connection with sutures than with screws, on account of constriction of the tissues by the former.

Infection does not easily spread with either screws or sutures because a granulating channel is soon formed which affords a protecting wall against bacterial invasion. In order to elucidate this point more clearly some experiments were conducted on dogs by my associate, Dr. O. S. Fowler. By inserting screws through the soft parts into the bones he was able to demonstrate that the holes become lined with granulations in the course of three or four days (the specimens were examined by Dr. Philip Hilkowitz) and it is not unlikely that a certain degree of protection begins even earlier. Secondary infection, however, really does not occur until much later than this, if proper precautions have been taken, thus giving ample time for the walling-off process to become complete. On occasion I have left clamps in place for from two to four weeks without manifest infection, and others have had similar experiences. During this period considerable protection is undoubtedly afforded by loose dressings, which favor rapid drying of the secretions, and by the occasional application of alcohol or of weak tincture of iodin to the vicinity of the screw-holes.

3. It is said that external clamps are difficult to use in certain cases. This is undoubtedly true, especially near the ends of the long bones, where the terminal fragment is too small or the cancellous tissue too soft for the screws to obtain a sufficient hold.

The whole question may, I think, be fairly epitomized as follows:

Both the plate and the clamp have their legitimate uses. In the hands of surgeons especially skilled and experienced in work of this kind, like Mr. Lane, for instance, plates may be more or less successfully employed at will. With the great majority of surgeons, however, the external clamp, when practicable, should be the instrument of choice, although there will always be those who will prefer the plate, in order to demonstrate their ability to use it.

The external clamp is especially indicated in connection with the shafts of the long bones, when the fracture is not too near the epiphysis or too deeply situated, as in the thighs of extremely fleshy or muscular individuals.

It almost goes without saying that clamps should always be employed in preference to plates in compound fractures where there is danger of infection resulting from the injury. It being a foregone conclusion that whatever is put in will have to come out again, it seems purposeless to use something which cannot be removed without a special operation and which adds to the danger of sepsis by its proximity to the line of fracture and by its size.

Metropolitan Building.

ABSTRACT OF DISCUSSION

DR. JOHN B. MURPHY, Chicago: The subject of treatment of fractures is, at this particular time, paramount in our surgical clinics. The proposition of doing an open operation for a fracture is much more serious than is the proposition of opening the abdomen, because you are dealing with tissues which while not so dangerous to life if infection does occur are enormously more easily infected. If a man can do an open operation for fracture and obtain aseptic healing, with regularity, he is doing the ideal thing. The control of the possibility of infection, however, is not always in his hands. There are many conditions that contribute to the occurrence of infection in the reduction of the fracture and its permanent fixation, and I am pleased to know that the doctor is endeavoring to get an accurate and perfect apposition by means of a device that does not expose the line of internal laceration and the fracture to infection. The Lane plate is the ideal means, to my mind, of holding together mechanically the fragments of the bone, provided it is placed by a man who is a master of the technic and who always attains perfect asepsis. There is still another element, however, in the management of fractures that is being overlooked. Why is it that we are having ten, fifty, one hundred cases of non-union of fractures to-day, where we had only one in the decade from 1885 to 1895. My interpretation of that is that in the modern management of fractures with, first, the plaster cast; second, the Lane plate and, third, the instruments and appliances that absolutely immobilize the line of fracture there is not sufficient irritation to stimulate osteogenesis at the line of fracture. We have failed to learn what the Germans learned when they began to use plaster casts. The German surgeon, after applying the cast, starts his patient as an ambulatory case. He moves around and there is sufficient stimulation of the ends of the fragments to favor osteogenesis and healing of the fracture. The American surgeon, as a rule, puts on a plaster cast and confines the patient to bed for from five weeks to five months, and at the end of that time he is surprised to find not even the slightest effort at regeneration of the bones. Mr. Lane during his last visit in this country emphasized the fact time and again that the Lane bone plate should not be used in cases of non-union. He recognizes the fact that there is something in connection with the fixation of the fragments that retards or at least does not stimulate osteogenesis in non-union cases. Another point which I was glad to have Dr. Freeman mention, because it is a most important one, is putting foreign bodies into compound fractures. If we could only learn to keep our hands, our nails, our screws, our spikes and our bone-splints out of fractures that are in all probability already mildly infected, we would have much better results in the treatment of compound fractures. After swabbing the surface with iodin solution, a dressing of gauze soaked in alcohol should be applied and the whole limb immobilized for many days unless the temperature or other conditions indicate a change.

Dr. L. L. McArthur, Chicago: Heartily in favor as I am of the recommendations of Dr. Freeman, I want to emphasize the fact that the statement is not correct that a limb cannot be handled after the use of a plate, whereas it may be handled after the use of the apparatus he described. Having just returned from the Canal Zone, where the opportunities for the treatment of fractures have been surrounded by more difficulties than in any other portion of the world, I want to say that they have found there that the introduction of the Lane plate makes it possible for them to treat the terrible cases of fracture they have had. These fractures are the result of dynamite explosions and crushings; they are usually compound, and these Lane plates have been put on every one of them. I saw 210 roentgenograms of cases that had been plated, and every one showed that a plate can be used in these fractures with good results, and in such a climate as that the plaster-of-Paris cast cannot be used because it becomes limp in a week. Therefore we must not conclude that the bone plate applied in a dirty wound will not enable us to handle the limb like a simple laceration of soft tissues. It can be done.

Dr. A. E. Hertzler, Kansas City, Mo.: I wish merely to throw out a few points as to why non-union occurs when a Lane plate or any other metallic appliance is used. The first step in wound healing is the precipitation of fibrin in the exudate, and anything that prevents that from occurring, prevents healing of the fracture. That is the whole problem. When a piece of metal is placed in a tissue a large amount of exudate is formed which does not coagulate readily or may remain permanently in a fluid state. Different metals act in slightly different ways. Silver produces more of an exudate than any other metal I have tested. Aluminum bronze produces the least. The problem in using a plate is to prevent the collection of this exudate. The best means for doing this is to provide drainage, so that the fluid can escape, or to place the plate in a tissue the least likely to produce exudate. For instance, in the thigh, in which there are large pads of muscles, more of this fluid collects than in the leg. For the same reason less fluid collects on the anterior surface of the tibia than on the external surface. Therefore the plate should be placed in the subcutaneous connective tissue rather than in the muscle bed when this can be done. If we are forced to use a splint where there is much muscle tissue, with the attendant abundant exudate, non-union will occur less often if the excess of exudate is drained away from about the plate until the ends of the bones not in touch with the splint have had time to become imbedded in fibrin—about forty-eight hours.

Dr. Carroll W. Allen, New Orleans: Dr. Parham has a method which is particularly applicable in the treatment of spiral or comminuted fractures with which it is not necessary to place a clamp on by screws or to use a nail through an oblique fracture. The instrument consists of two parts: (1) a metal band one-fourth of an inch in width with one end expanded and containing a slit through which the other end is slipped, making a loop; and (2) an apparatus consisting of a screw-rod, working on the principle of an écraseur, between two parallel steel bars for the purpose of drawing up the band and tightening it. In applying the band this is first placed around the bone at the site of the fracture with the oblique fragments adjusted, and one end is slipped through the slit at the other end and then attached to a hook on the screw-rod in part two. The screw is then worked, drawing up and tightening the band around the bone. When it is sufficiently tight the instrument is bent over causing the band to be bent on itself and clinching it. The band is then cut off close with a pair of pliers and the instrument removed.

Dr. Leonard Freeman, Denver: You will remember that my plea was not for the universal use of the clamp in preference to the plate, but merely for its more frequent use in suitable cases. Dr. McArthur has made me say that a fractured limb could be picked up by the heel when a clamp was used, but not where a plate was employed. What I really said was that the limb could be picked up just as well when the external clamp is applied, as when the internal plate was used, and perhaps better. He said that in Panama many metal plates were put in. It would be more interesting to know not the number of plates put in, but the number of plates that have had to be taken out afterward. The number is probably considerable. Dr. Hertzler spoke of the reasons for non-union and insisted that drainage would be desirable. This is obtained with the external clamp. One of the main reasons for non-union when the internal plate is employed is that the metal comes in contact with the line of fracture. With the external clamp there is no metal in contact with the line of fracture, or, of necessity, anywhere near it.

A STUDY OF THE USE OF ICE AND OTHER MEANS OF PRESERVING FOOD IN HOMES*

JOHN R. WILLIAMS, M.D.

ROCHESTER, N. Y.

The problem of pure milk is only partly solved with the introduction of clean milk into the home. The cleanest and purest milk may soon become foul if adequate means for its preservation are not used. It is well known that bacteria multiply with great rapidity above 50 F., while below that temperature their growth is held markedly in check. These facts are of importance to mothers and housekeepers, also to milk commissions and dealers, because charges of "bad milk" are often unjustly made against those interested in pure-milk work.

In a recent study of the market milk problem in Rochester, it was noted that for purposes of economy nearly half of the families of the city endeavor to get along without ice. In such homes condensed milk, proprietary milk and dipped milk purchased at the near-by store are mainly used. These facts led me to investigate more intimately the use of ice in homes and the means available for the preservation of food. Five sections of the city, representing socially and economically different classes of people, were studied. Upward of a hundred homes in each district were visited. Information was secured, when possible, along the following lines:

1. Inquiry into the use of milk, means of caring for it, etc.
2. Temperature measurements of refrigerators, living rooms and cellars.
3. The make, size and description of refrigerator.

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* Read in the Section on Preventive Medicine and Public Health of the American Medical Association, at the Sixty-Fourth Annual Session held at Minneapolis, June, 1913.

4. The amount of ice used weekly and yearly, the cost of the ice, name of dealer, etc.

During the warm months of the year, milk is delivered during the night or early morning, on an average of three hours before the family is awake. When no box is provided for receiving it, it must be deposited on the door-step where it is exposed to the heat, dust and the attentions of the domestic animals of the neighborhood. Few homes in those sections occupied by working people are equipped with boxes for receiving milk. In an investigation on this point, of 604 homes examined, only eleven had milk boxes. Houses in the well-to-do sections are better equipped, for 359 out of 411 had proper facilities for receiving milk. The exposure of milk to warm air for three hours or more is sufficient to raise its temperature at least 10 degrees.

The usual means of preserving perishable fresh foods in the home is to store them in a cool place as the pantry, cellar or refrigerator. When the latter is not afforded, either the cellar or living-room is used. In a former and more extended inquiry into the use of ice in all parts of the city, it was learned that 2,243 homes of 5,431 examined did not use ice. In the present and more limited investigation, in which the very rich and very poor were largely avoided, 161 homes of 519 studied were not using ice any of the time. It is probably within the truth to say that half of the homes in the city rely the entire year on the cellar or pantry for their food preservation, and that more than three quarters of the homes deny themselves the use of ice, excepting for a few weeks during midsummer.

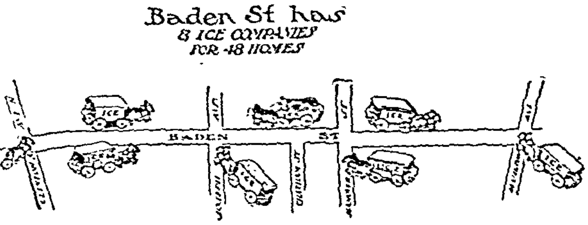

Fig. 1.—The wasteful method of ice distribution. There is a different ice dealer for each five to fifteen consumers on every street.

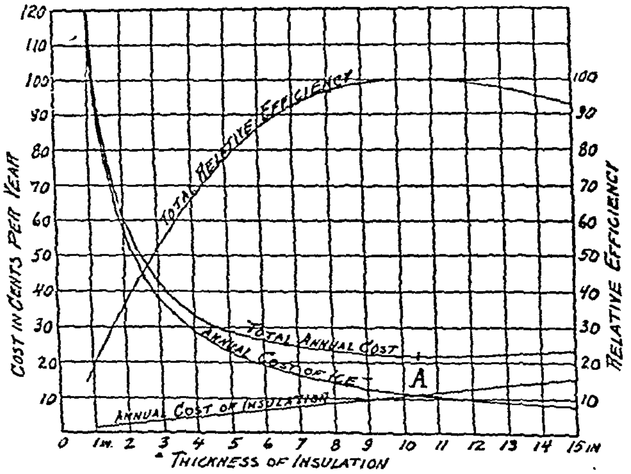

Fig. 2.—Chart (Lundgard) showing the relation of thickness of refrigerator wall made of the best insulation to the efficiency of the refrigerator, and also the comparative cost for operation per square foot of wall surface.

In view of these facts temperature observations of cellars and living-rooms where food is stored, as well as refrigerators, are of importance. In Table 2 it will be seen that not one living-room was found having a temperature below 60 F., nor was one cellar discovered having a temperature below 55 F. It is clearly evident therefore that these rooms during the warm months of the year, at least, are not sufficiently cold to protect food from bacterial decomposition.

In the study of ice-boxes, 243 were examined. Of these only 103 had a temperature below 50 F. The other 143 registered above that temperature and were therefore worthless for preserving food. As would be expected, a better class of refrigerators is to be found in the homes of the well-to-do; nevertheless, 45 per cent. of these had temperatures above 50 F., while nearly 70 per cent. of those found in the homes of the working people exceeded that temperature.

TABLE 1.—USE OF ICE AND MILK AND THE NUMBER OF DEALERS ENGAGED IN THEIR DISTRIBUTION*

Section	No. Homes Studied	No. People in Homes	No. Homes Taking Ice	No. Ice Companies Supplying Section	No. Milk Dealers Supplying Section	No. Homes Having Milk Boxes
Well-to-do	143	613	134	8	30	91
American laboring ...	118	509	71	7	27	14
Jewish laboring	155	785	120	17	48	15
Germ.-Amer. laboring.	49	210	29	7	22	2
Italian laboring	54	199	4	..	..	2
Totals	519	2,316	358	..	..	124

* The foregoing data do not fully show the waste in ice distribution occasioned by the overlapping of routes. There is a different ice company on every street for each five to fifteen consumers. In the first sction, on Dartmouth Street there is a different distributor for each eight consumers. In the Jewish section, on Baden Street eight ice dealers supply forty-eight homes. In the American laboring section on Adams Street there is an ice dealer for each four consumers.

TABLE 2.—TEMPERATURES OF REFRIGERATORS, LIVING-ROOMS AND CELLARS DURING MONTH OF AUGUST, 1912, ROCHESTER, N. Y.

Section	Refrigerators				Living-Rooms			Cellars		
	Below 45°.	45° to 50°.	51° to 60°.	Above 60°.	Below 60°.	60° to 70°.	Above 70°.	Below 55°.	Below 60°.	Above 60°.
Well-to-do ...	27	34	48	1	0	64	35	0	6	78
American laboring	1	10	18	10	0	24	11	0	22	29
Jewish laborboring	16	14	34	8	0	28	44	0	0	75
German-American laboring	1	0	19	2	0	4	18	0	4	29
Italian laboring	0	0	0	0	0	0	0	0	0	10
Totals	45	58	119	21	0	120	108	0	32	221

SUMMARY

Refrigerators studied	243
Refrigerator temperatures below 50 F.	103
Refrigerator temperatures above 50 F.	140
Refrigerators in well-to-do section below 50 F.	61
Refrigerators in well-to-do section above 50 F.	49
Refrigerators in laboring section below 50 F.	43
Refrigerators in laboring section above 50 F.	91
Number of cellars or living-rooms below 55 F.	0
Number of living-rooms examined	228
Number of cellars examined	253

The main reason for the inefficiency of these refrigerators is to be found in their defective construction and insufficient insulation. Most of them are wooden boxes built of half-inch lumber, and are lined with galvanized iron or zinc. The walls vary in thickness from less than 2 inches to less than 4 inches (see Table 3). The space between the metal lining and the wooden sides usually contains insulating material, as paper, felt or mineral wool. In many of them nothing more is to be found than a sheet or two of paper. Since the efficiency of a refrigerator depends in large part on the character and thickness of the insulating material, consideration must be given to these factors. It has been proved both experimentally and practically that confined air or a partial vacuum are the best insulators. Indeed, it is the air entrapped within its cellular structure which retards the passage of heat through a material and gives it insulating value. The air must be confined, for circulating air is a good medium for the conduction of heat. A good insulator therefore must have a physical structure which will hold air within its cells or between its fibers. Moreover, it must be water-proof. Moisture, because of its greater power of heat conductivity, is a fatal enemy to perfect insulation.

TABLE 3.—THICKNESS OF WALLS OF REFIGERATORS *

Section	Less than 2 in.	2 in. to 2¼ in., inclus.	2½ in. to 2¾ in.	3 in. or more
Well-to-do	5	36	34	19
American laboring	9	23	4	3
Jewish laboring	17	42	8	1
German-American laboring	4	13	3	1
Italian laboring	0	0	0	0
Totals	35	114	49	24

* A *properly constructed* box, to be economically operated, should have a wall of efficient insulating material at least 6 inches thick. Such a box at the current price of ice will have a theoretical efficiency of about 80 per cent. The 149 refrigerators whose wall thickness is less than 2¼ *inches*, even were they made of the best possible construction, could not have an efficiency above 40 per cent. The remaining seventy-three refrigerators with walls averaging less than 3 inches could not have an efficiency above 50 per cent. As a matter of fact, with the shoddy and imperfect insulating materials used, most of the ice-boxes in *common* use rate far below their theoretical efficiency.

TABLE 4.—NUMBER OF MONTHS ICE IS USED DURING YEAR BY HOMES IN VARIOUS SECTIONS OF ROCHESTER *

Section	1 mo.	2 mos.	3 mos.	4 mos.	5 mos.	6 mos.	7 mos.	8 mos.	9 to 12 mos.	Total
Well-to-do	0	2	5	15	22	24	15	8	33	124
American laboring	1	6	10	14	21	3	4	4	3	66
Jewish laboring	0	4	16	26	47	15	5	1	1	115
German-American laboring	1	1	4	8	15	0	0	0	1	30
Italian laboring	0	0	2	0	0	0	0	0	0	2
Totals	2	13	37	63	105	42	24	13	38	337

* This table shows, among other things, the seasonal character of the use of ice. This adds greatly to the cost of distribution, because it necessitates a large investment in equipment, most of which is idle during half the year.

A refrigerator wall which contains a space large enough to permit of air circulation will be found defective. Wood, felt, mineral wool, charcoal, sawdust, wood-ashes, etc., are fairly efficient when they are dry, but when damp or wet their efficiency markedly declines. When an efficient insulator is used there is very little difference between the temperature of the inside of the box and the temperature of that side of the metal lining which is next to the insulating material, consequently there will be very little deposition of moisture on the metal lining to be absorbed by the insulator. When the insulator is inefficient, however, the temperature difference is considerable and there is marked condensation of moisture on both sides of the metal lining. If this moisture is absorbed by the insulator it materially lessens its efficiency. In any event it causes the metal lining to corrode and makes the box damp and insanitary. Most of the commonly used insulators take up moisture with avidity, and for this reason most of the cheap refrigerators in common use will be found coated on the inner side of the inside wall with slime and the mineral salts resulting from the metallic corrosion.

Properly made cork board is probably the best-known and most efficient insulating agent. It is made of ground cork pressed into slabs and heated until the resins in the cork cement its particles together. It is to the remarkable physical structure of cork that its *insulating efficiency* is due. It consists of a woody material, filled with tiny air cells through which air circulation is not possible; moreover, it is impervious to moisture.

The comparative value of dry wood and the best cork board is as 1 is to 5; that is to say, 1 inch of cork board is equivalent in insulating value to 5 inches of wood. Since it requires 6 inches of cork board to give approximately 80 per cent. of efficiency in cooling, at the current prices of ice, it follows that few refrigerators in common use have an efficiency above 25 per cent. Indeed, the low-priced boxes used in the homes of working people are probably less than 15 per cent. efficient. This means that of 100 pounds of ice put into the refrigerator, at least 80 pounds are used in neutralizing the heat which percolates through the wall. It is worthy of note that the market is flooded with these shoddy ice-boxes. No less than seventy-five different makes were

TABLE 5.—NUMBER OF HOMES USING VARIOUS AMOUNTS OF ICE WEEKLY

Section	50 lbs. or less.	75 lbs.	100 lbs.	100 to 200 lbs.	200 to 300 lbs.	300 lbs. plus.	Total.
Well-to-do	0	3	22	74	24	11	134
American laboring	11	15	18	23	2	1	70
Jewish laboring	5	18	8	16	2	0	49
German-American laboring	3	5	8	15	0	0	31
Italian laboring	4	0	0	0	0	0	4
Totals	23	41	56	128	28	12	288

TABLE 6.—PRICE PAID FOR ICE PER YEAR; DATA FROM 321 FAMILIES *

Section	Under $5.	$5 to $10.	$10 to $15.	$15 to $20.	$20 and over.
Well-to-do	6	36	33	13	34
American laboring	34	16	5	1	4
Jewish laboring	22	72	10	6	1
German-American laboring	8	14	1	1	0
Italian laboring	4	0	0	0	0
Totals	74	138	49	21	39

* Two hundred and twelve families pay $10 or less per year; 109 families pay more than $10 per year. It is worthy of note *that at least 75 per cent.* of the money each family pays for ice is wasted, partly in the uneconomical method of distribution, but chiefly in the inefficiency of the refrigerators.

found among the 243 examined. Few of them bear the names of their makers, which suggests that the manufacturer is not proud of his handiwork.

The rate paid by the consumer for ice varies according to the amount used, the amount taken at each delivery, and the ability of the purchaser to pay for it in advance. Poor people living near the railway tracks get it at the cars for 20 cents per hundred pounds. If it is delivered to their homes they pay from 40 to 75 cents per hundred pounds.

The cost of harvesting and storing natural ice is so variable that it is difficult to determine it even approximately. It is probably within the truth to say that it costs less than $2 per ton. It costs between $2 and $2.25 per ton to make artificial distilled-water ice, although by some of the newer methods this cost has been materially reduced. The consumer pays the dealer the difference betwen $2,25, the cost of manufacture, and $8.50 per ton, or $6.25 for distribution. Thus the cost of distribution is nearly three times the cost of manufacture. One reason for this is the wasteful method employed. In Rochester a different ice company will be found supplying each five to fifteen consumers on every street, necessitating a tremendous waste in labor and delivery equipment.

CONCLUSIONS

The data gathered in this investigation warrant the following conclusions:

1. The temperatures of cellars or living-rooms in dwelling-houses are not sufficiently low during the warm months of the year to protect milk and other perishable foods from rapid bacterial decomposition. Therefore an efficient refrigerator in the home is a necessity.
2. Most of the refrigerators in common use are almost worthless and grossly uneconomical.
3. There is a large field for the manufacturer who will make a properly insulated and efficient box which can be sold at a moderate price.
4. If more economical methods of ice manufacture and distribution were employed, the cost of ice to the consumer could be materially lowered.
5. If to this saving were added that which would result from proper ice-box construction, refrigeration vastly superior to that now found in the average home could be had for at least one-fourth the present cost.

388 Monroe Avenue.

ABSTRACT OF DISCUSSION

Dr. L. S. B. Robinson, St. Paul: The preservation of the lives of babies among the poor often depends on the ability of the family to obtain ice, the cost of which is often prohibitive. The people of St. Paul are at present witnessing the formation of an ice trust, and in another year or two they expect to see the monopoly completed and the price increased. The Fabian Society has been holding meetings in St. Paul for the last three weeks to arouse public sentiment for a municipal ice plant. As president of the society, I have given the ice business in different parts of the country careful study and the cost as we have found it is even less than the figures Dr. Williams gives.

In a cold climate like ours natural ice is cheap. Men who have been in the business tell us that an ice-house on the shore of a lake can be filled for ten cents a ton; freight into the city is estimated at forty cents a ton. If ice is cut from a nearby lake and hauled at once to an ice-house in the city it has been put up there at a cost of fifty cents a ton. From 40 to 45 per cent. is allowed for shrinkage, so that nearly double the amount sold must be harvested. We are therefore safe in placing the cost at one dollar a ton.

Distribution is the expensive item. The testimony of men in the business and the books of those bought out last year show that they do not pay over $1.50 per ton for delivering ice into the ice-box. That makes a total of $2.50. The selling price is $7 a ton. We have demonstrated that the municipality could undertake the business at $4 a ton, pay the same wages for much shorter hours of labor and still have enough profit to pay all overhead charges and retire the bonds after one year on a harvest of a quarter of a million tons.

In Tucson, Ariz., the Santa Cruz (artificial) Ice Co. reports ten years' experience. On a charge of twenty-five cents per hundred pounds, or a rate of five dollars a ton, they have set aside 5 per cent. for depreciation and made 15 per cent. dividends on their investment, even in such a hot climate. That the municipality could deliver ice to the consumers for about half the present price is plain on careful study.

Dr. J. R. Williams, Rochester, N. Y.: I have been asked to describe a simple, model ice-box. An ice-box, such as I have in mind, may be made by anyone handy with tools or by a carpenter at a small cost for labor. It should be made of cork-board, which comes in slabs of any desired thickness and in convenient lengths and widths. A skeleton frame of wood should be made of the shape and capacity of the ice-box desired. On this frame should be tacked the cork-board slabs, which should first be coated with tar or asphaltum. One surface should be left for the door. After the first layer of slabs has been attached to the frame, a second layer should be applied, over the first, the two being cemented together with tar or asphaltum and the slabs toe-nailed to each other. Care should be taken to lap the joints in fastening on the slabs. The cork-board should be at least 2 inches thick. After the box has been made, the frame should be removed and the inside and outside of the box coated with a very hard-surface cement about one-fourth of an inch thick. A door may then be made of wood, with a cork-board lining. It should be beveled and fit as tightly as possible into the door-frame which should also be made of wood. A small box such as I have in mind may be made for about twelve dollars. It will have far greater efficiency and almost as much capacity as a forty dollar refrigerator.

How much one is justified in paying for a refrigerator depends largely on the cost of ice. If ice is to be had for small cost, one can afford to waste it in poor insulation, but if ice is expensive, and it is in most American cities, it will be found economical to provide good insulation, which means the purchase or making of a good refrigerator. A small, efficient, built-in refrigerator should be a part of the equipment of every small home, just as much as is the bath-tub or furnace.

The community should control the manufacture as well as the distribution of ice, to the end that it may be had freely and cheaply by all its citizens. By the most approved methods, artificial ice can be made for about $1.10 per ton. By the older methods, still commonly used, it costs about $2.10 per ton. The average cost of ice distribution, of all business, in several American cities, is about $3.25 per ton. The consumer now pays about $6 per ton for distribution.

Infant Mortality in Bavaria for 1912.—According to the tables of the Royal Statistical Institute, 37,006 children under one year died in 1912, exclusive of stillbirths. This is a diminution compared with the previous year of 9,659 or 20.7 per cent. Among these there were 30,855 legitimate and 6,151 illegitimate children. If the number of infant deaths in this year is compared with the births, the infant mortality in 1912 amounted to 17.7 per cent. and that for 1911 to 23.3 per cent. About a third of the infants born did not live through the first month and more than half failed to survive their first quarter. The statistics show that illegitimate children have a greater relative mortality, especially in the first months of life than children born in wedlock. The mortality is relatively slightly greater in the country. The summer months of 1912 do not show so high a death-rate as those of 1911, a difference due to the excessive heat of the summer of 1911. As is well known, the danger from the heat is best avoided by breast-feeding, careful handling of the milk supply for infants, not overloading infants with clothing, and care in cooling the living-rooms.

CLINICAL OBSERVATIONS ON ESSENTIAL HEMATURIA *

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For want of a more accurate term, I have retained that of "essential" for the type of hematuria which has not as yet been explained by any of the definitely established renal conditions causing hemorrhagic urine. The term "essential" should be limited to those cases of hematuria in which there is neither clinical evidence of renal insufficiency, visible organic change in the renal parenchyma nor any evidence of renal infection. The operative records of the Mayo clinic up to June 1, 1913, show twenty-six patients operated on for renal hematuria for which no evident cause could be found, and the clinical records show fifty-one patients not operated on in which the clinical diagnosis of essential hematuria was evident.

SYMPTOMATOLOGY

Sex.—Of the 77 patients, 58, or 75 per cent., were males and 19, or 25 per cent., females. The preponderance of males is noteworthy and is in keeping with that of renal infection occurring in the male.

Age.—At the time of examination 6 patients were under 30 years, 10 between 30 and 40, 24 between 40 and 50, 17 between 50 and 60, and 12 over 60. The majority of cases occurred in persons between the ages of 40 and 50, while only a small number of patients were below 30 years.

Localization.—On cystoscopic examination the disease was localized to the right side in 51 cases and to the left side in 26. Pain was described as a dull ache across the sacrum in 10 of the 77 cases, in either lateral abdomen in 6 cases, but never to such a degree as to be of any practical significance. It was described as severe in 5 cases, and then only with hematuria, the pain evidently being caused by blood-clots blocking the affected ureter.

Duration of Symptoms.—Of the 26 patients operated on, hematuria had first appeared over a year before in 16, or 61 per cent., over 5 years in 10 cases, or 38 per cent., and 15 years or more in 5 cases, or 19 per cent. It had continued prior to operation for a year or more in 5 cases, or 19 per cent., over 3 months in 18, or 69 per cent., and over a month in all but three of the cases. Of the 51 patients not operated on, hematuria was noted less than three months before in 23 cases, over a year before in 12, or 23 per cent., over 5 years in 10, or 19 per cent., and over 10 years ago in 5, or 9 per cent.

Physical Findings.—In three of the cases the affected kidneys appeared to be enlarged, on palpation, as though there might be tumor, but at operation they were found to be large, normal kidneys. In three other cases the kidney was described as low-lying and movable, in two of which the condition was found bilateral. Evidence of a central nervous lesion or marked neurosis was absent in all. In the 34 cases in which the blood-pressure was recorded the average was 132; in 2 cases it was more than 150. Ophthalmoscopic findings were practically negative in all. The general strength was lowered to such a degree that 19 of the 26 patients operated on were unable to carry on their daily occupation and only 6 of the 51 patients not operated on. The average hemoglobin estimate of the patients operated on was 63 per cent., while that of the patients not operated on was 84 per cent.

Urinalysis.—The specific gravity of twenty-four-hour specimens taken in 21 of the cases in which there was operation was below 1.015 in but 3 cases. In the other cases the average was 1.023. Albumin in varying amounts was found in all the cases in which operation was performed, as was to be expected as a result of the hematuria present at the time of examination. A few hyaline casts were found in 4 cases and occasional granular casts in 2 cases. A few microscopic pus cells were found in 5 of the cases in which the patients were not operated on.

Hematuria.—The hematuria was reported as being present in a marked degree in 54 cases, or 70 per cent., and but slightly in 23 cases, or 30 per cent. In 63 cases it varied in degree at various times.

Pyelogram.—The pyelogram with essential hematuria necessarily shows the outline of a normal pelvis. Evidence of abnormality would call our attention to the probability of some other condition being present even though no other symptoms were found.

DIFFERENTIAL DIAGNOSIS

The diagnosis of essential hematuria is most often confused with that of chronic nephritis, infectious nephritis, pyelitis, neoplasm, tuberculosis and lithiasis.

Chronic Nephritis.—The hematuria of nephritis is sharply defined from that of essential hematuria. It is usually present in a lesser degree and may vary from day to day. Scanty urine and the presence of many granular casts, edema, headache, increased arterial tension, lesions in the retina, any or all of which characterize nephritis, are necessarily absent with essential hematuria. Borderline cases which may have some characteristics of both conditions rarely occur. The conditions are usually widely separated clinically and it is difficult to understand from a clinical point of view how any relationship can be traced between the two conditions. When hematuria occurs with chronic nephritis, it is usually regarded as a terminal symptom, whereas it may be disregarded in a case of proved essential hematuria.

Infectious Nephritis.—Chronic infection in the kidney may be the cause of hematuria often resembling that of essential hematuria. It may appear insidiously without clinical evidence of infection other than microscopic pus and bacteria in the urine. More often, however, it is characterized by attacks of dull pain referred to one or both kidneys, chills and fever, together with microscopic pus, bacteria and gross hematuria. The hematuria is usually slight or comparatively moderate in degree. It may be present only during the acute attack or it may appear irregularly without the clinical evidence of infection. Pain, which is usually slight with essential hematuria, may be marked with the infectious nephritis, and is more often accompanied with fever and chills and other evidence of infection. The infecting organism can usually be identified in the urine taken under aseptic precautions. As Billings[1] has reported, the hematuria and other symptoms may disappear on administering autogenous vaccine. This was the result in one of four cases in which the vaccine was tried at the Mayo Clinic. The clinical evidence of renal insufficiency is usually absent until late in the disease. Although this condition is more often bilateral, four patients have been operated on in whom the clinical findings and subsequent course would indicate that the infection was unilateral. In these cases the kidney was found at operation to be smaller than normal, soft and irregular in contour. On section cicatricial changes of evident previous infection were apparent. Needless to say, with essential hematuria the urine should be free from pus and bacteria. The cicatricial changes in the pelvic outline of infectious nephritis as shown in the pyelogram are not usually extensive enough to be of diagnostic significance.

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* Read in the Section on Genito-Urinary Diseases of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

[1] Billings: Am. Jour. Med. Sc., 1910, cxxxix, 625.

Bleeding Pyelitis.—Hematuria is occasionally present with chronic infection of the renal pelvis. It occurs with a chronic indolent infection confined largely to the pelvis and without much active destruction of the substance of the kidney. The infective process may involve the tissues about the renal pelvis and the adjacent ureter to a varying degree. Subsequent cicatricial contraction and adhesions will bind the pelvis and renal pedicle firmly and distort the pelvic lumen. When the upper ureter is involved it may either become dilated or partially constricted as a result of the cicatricial process. The mucosa of the pelvis in such cases shows irregular areas of inflammation and congestion which bleed on touching, and on close inspection appear to be granular. Between these areas the mucosa may be seen pale and glistening as the result of the chronic cicatricial changes. On microscopic examination the granular mucosa shows a papillomatous proliferation of cells. The latter condition was first described by H. Chiari[2] and recently by von Frisch,[3] and is called pyelitis granulosa. Occasionally the papillae alone are involved and the hematuria may result from the consequent papillitis. The hematuria which is seen occasionally with extensive hydronephrosis is caused by a similar condition in the mucosa, as the evident result of a chronic indolent infection. Clinically, hematuria of pyelitis may be subjectively differentiated from the essential hematuria by the character of the pain which frequently accompanies pyelitis. It is usually a dull, persistent pain with irregular acute exacerbations occurring without evident cause. Pain with essential hematuria is exceptional and occurs only as the result of an occluding blood-clot. Bleeding pyelitis might be confused with that of infectious nephritis, which, however, occurs more often in typical attacks with chills, fever and slight hematuria. On urinalysis microscopic pus will always be found present with pyelitis granulosa. Because of the indolent type of the infection but a few pus-cells may be present among the red blood-cells. Needless to say, only the specimen obtained by ureteral catheterization is of value, because pus-cells in the voided urine may come from any extrarenal source. The most accurate method of differential diagnosis is obtained through pyelography. The outline of the pelvis and adjacent ureter will appear irregularly narrowed and dilated. One or more of the calices may be irregularly dilated; more often they are effaced.

Neoplasm.—Although the hematuria of neoplasms is often present to a marked degree like that of essential hematuria, it usually persists but a short time and appears at irregular intervals. Unfortunately the occasional short hemorrhage does not cause the average patient to consult a physician so often as the protracted one. The presence of tumor will usually identify the nature of the hematuria, but in twelve of ninety-one patients operated on for malignant tumor of the kidney at the Mayo Clinic, definite tumor could not be determined clinically. It is this group of tumors which is easily confused with essential hematuria. Two methods are available in identifying the existence of a surgical condition, namely, pyelography and the renal functional estimate. It has been shown that the kidney with essential hematuria will not manifest any marked decrease in functional activity as measured by the secretion of phenolsulphonephthalein injected. It has been my experience that non-infected neoplasms without hematuria will show decrease in function in but 25 per cent. of cases. Unfortunately, renal tumors too small for definite palpation would show even a smaller percentage. Furthermore, profuse hemorrhage offers considerable technical difficulty in the accurate estimation of the amount of dye secreted. With marked comparative reduction of functional activity of the bleeding kidney, however, the existence of neoplasm should be suspected. Pyelography will more often be of value in ascertaining the existence of neoplasm by demonstrating an abnormal outline of the renal pelvis subsequent to tumor-retraction. While recognizable deformity of the pelvis may be demonstrated in over two-thirds of tumors of the kidney that come to operation, early tumor may not show recognizable deformity. Nevertheless, any tumor that is so far advanced as to cause hematuria will probably cause recognizable pelvic deformity. Even after all possible clinical evidence has been obtained, the question will often be raised whether or not operation is indicated. Tumor of the kidney was discovered at operation in two cases in which the clinical evidence rather suggested essential hematuria.

Renal Tuberculosis.—Occasionally the first and only evidence of renal tuberculosis is hematuria. In such cases the hematuria will usually be well marked and persist but a day or two, often showing but one hemorrhage. In the absence of pus in the urine and other evidence of tuberculosis on physical and cystoscopic examination, its existence could easily be overlooked. If there is any probability of tuberculosis, guinea-pig inoculation should always be made. Of three cases of hematuria regarded on clinical examination as being essential, two were proved to be tuberculous on subsequent examination, and in one the patient was reported as having died of renal and pulmonary tuberculosis.

Lithiasis.—A small stone pocketed at the end of a calix may be the cause of an otherwise symptomless hematuria and remain undiscovered even with the most careful roentgenographic technic. Urinalysis will usually show the presence of old blood-cells but no pus. A careful search should also be made for crystals, particularly those of calcium oxalate, which, if present in a considerable quantity, would be very suggestive of the existence of stone. On exploring in two cases regarded clinically as essential hematuria, such a stone was found at the end of a calix in one. In the other case a stone 2 cm. in diameter was found in the cortex, which, because of its soft character and the unusual obesity of the patient, did not show in the roentgenogram. Two more patients regarded clinically as having essential hematuria but not operated on reported having passed small stones several months after returning to their homes.

Renal Varix.—With the publication of a case showing angioma of the renal papilla, Fenwick[4] advanced a new explanation for a certain group of cases which had hitherto been called essential hematuria. It was at first believed that this condition would explain a large proportion of cases of essential hematuria. Recently a number of such cases have been reported in American literature. These might give the impression that the condition is a common one. Any report of such a condition without a microscopic section showing the dilated condition of the papillary blood-vessels cannot be of accurate value. Clamping the pedicle and consequent congestion of the tissue of the kidney may cause the papillae to appear so engorged as to give an impression of abnormality. True angioma is a comparatively rare condition and can explain but a very small percentage of bleeding kidneys. One such case has come under our observation in which microscopic section showed the typical dilated structure of the blood-vessels. The condition may be readily confused with the varicose condition of the blood-vessels adjacent to the pelvis as the result of insidious infection in the pelvis and surrounding tissues. With infection of the tissues the veins of the papillae will occasionally be found dilated on microscopic section. Leukoplakia of the pelvis was discovered on exploring the pelvis of the kidney in a case believed on clinical examination to be bleeding, because of essential hematuria. Pyelography will not as a rule be of much value in identifying the changes which affect the pelvic outline but moderately.

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[2] Chiari, H.: Med. Jahrb., 1881, 9.

[3] Von Frisch: Verhandlungen d. deutschen Gesellsch. f. Urolog., II. Kongress in Berlin, April 19-22, 1909, 270.

[4] Fenwick: Brit. Med. Jour., June 17, 1905.

After-Course.—Of the 26 patients operated on, nephrotomy was performed in 12 cases and neprectomy in 16. Exploration was made in 1 case. In 2 of the 12 patients in whom nephrotomy was made the hematuria persisted to such a degree that nephrectomy was necessary in 1 case three months and the other four months after the first operation. In 1 case of nephrectomy hemorrhage through the wound persisted necessitating nephrectomy two days after nephrotomy. In 1 other case of nephrotomy made four years ago the patient reports occasional hematuria in a diminished degree. The 8 patients reporting recovery following operation were operated on 1 six years, 1 four years, 2 three years, 2 two years, and 2 one year ago. In the patient operated on four years ago, hemorrhage was reported occurring a year after operation but none since then. Of the 16 cases of nephrectomy, 1 patient died elsewhere six months after operation from some unknown cause, and 1 was not heard from. Fourteen patients are living and are reported in excellent health 1 twelve years, 1 eleven years, 3 eight years, 1 nine years, 2 six years, 2 four years, 1 three years, 1 two years and 3 two years after operation. It will be noted, therefore, that nephrotomy is not to be regarded as a certain method of cure. The fact that recovery followed in 8, or 67 per cent. of the cases, should recommend it, provided the affected kidney appears quite normal on exploration. On the other hand, the excellent results obtained from nephrectomy should recommend such procedure providing the hemorrhage prior to operation had been severe enough to warrant it, that the patient's general condition was otherwise good and that the functional activity of the other kidney was previously ascertained. Of the 51 cases not operated on, we were able to trace but 44. In 26 of these cases the affected kidney was merely catheterized, with cessation of hematuria following. This cessation of symptoms remained permanent in but 4 cases. In 18 cases the pelvis was overdistended with methylene blue or colloidal silver solutions with permanent cessation of hematuria in but 3 cases. In 6 cases epinephrin (adrenalin chlorid P. D. & Co.) in solutions in 1:2,000 as advanced by Young[5] was introduced into the pelvis of the affected kidney. Recurring hematuria was reported in all cases except one treated six months ago. In one of two cases treated three years ago, hematuria was reported stopped over a period of one and one-half years. Horse-serum was injected in two cases, and human serum, as suggested by Barringer,[6] in one case with no immediate cessation of symptoms.

Treatment.—From the foregoing results it would seem advisable, as a rule, to treat essential hematuria conservatively. Needless to say, every means of diagnosis should be employed before exploration is undertaken. It has been our rule not to advise surgical exploration unless the hematuria was so marked as to incapacitate the patient or whenever evidence existed which suggested the possibility of neoplasm. The question of whether or not to explore for a possible neoplasm is one of the most difficult problems to solve in the clinical examination of hematuria. The possibility of renal tumor in a patient over 40 years of age whose general condition is below par and who has no clinical evidence of nephritis would justify surgical exploration even though the hematuria itself were not severe enough to warrant it. Exploration is not justifiable when no clinical evidence exists other than one or two spells of hematuria. In such cases ureteral catheterization or any of the various methods of renal pelvic irritation, such as overdistention, pyelography, epinephrin, etc., should first be tried, or, as has been recently suggested, the injection of blood-serum. An occasional moderate hematuria without other clinical symptoms recurring after these measures have been tried should not necessarily require any form of treatment. When the hematuria has incapacitated the patient, however, or when neoplasm is regarded as possible, exploration is indicated. The good results obtained from nephrotomy would justify its use provided nothing is found wrong with the kidney on exploration. If, on exploration, however, any evidence of previous infection or tissue-destruction exists or if nephrotomy should fail to stop the bleeding, nephrectomy is indicated.

Etiology.—Of the various etiologic factors that have been advanced to explain essential hematuria, nephritis seems at present to have the most supporters. Of recent years pathologic evidence in support of this theory has been advanced by Israel, Nichols, Kretschmer, Kapsammer, Stoerk and others. Microscopic examination of bleeding kidneys removed at operation and postmortem discloses areas of greater or lesser extent with varying degrees of nephritis in practically every case if carefully searched for. An examination of the pathologic material of bleeding kidneys removed at the Mayo Clinic shows eleven specimens. Of this number, three show nothing but a few glomeruli with cicatricial changes, one is quite normal on serial section, and the others show moderate degrees of increase of interstitial connective tissue as well as glomerular changes. None of them show the marked destructive changes found with clinical chronic nephritis. Section of kidneys removed in the last 320 post-mortem examinations of patients (Broders) who had no clinical evidences of advanced renal disease, shows some evidence of nephritis in 200 cases, or 63 per cent. In none of these cases had hematuria ever been reported and none had clinical evidence of nephritis. On comparing microscopic sections it was impossible to differentiate the character of the microscopic changes found in the bleeding and non-bleeding kidneys. It is quite evident that there must be some other factor involved which causes one of two kidneys to bleed when the microscopic changes are quite similar. Because nephritic changes are found in a bleeding kidney it does not necessarily follow that nephritis causes the hematuria.

The clinical evidence obtained on examination and observation of the after-course of patients suffering with essential hematuria does not support *any* nephritic etiology. Four of the patients operated on and three of those not operated on gave histories of hematuria of fifteen years or more prior to examination. If the hematuria were one of the earliest symptoms of nephritis the progress has been rather slow. Furthermore, the number of patients who have been entirely well five years or more since nephrectomy is not in keeping *with the* usual course of a patient suffering with chronic nephritis from whom one of two diseased kidneys are removed. Whatever the cause of the hematuria may be, if systemic, it apparently does not tend to shorten life, at least to *any* great extent. In support of the nephritic theory it has been advanced that many cases show traces of albumin or occasional casts in the urine in the interval when no hematuria is present. The routine examination of the urine of five thousand patients examined consecutively at the Mayo clinic during the past year shows a trace of albumin in 1,450, or 29 per cent. Less than a hundred of these patients had any clinical evidence of nephritis and none of them had essential hematuria. The overwhelming proportion of patients with albuminuria as compared with those suffering from hematuria demands further explanation than that of nephritic change. Furthermore, the term "nephritic" is an unfortunate one for this type of hematuria now called "essential," and tends to confuse it with the hematuria accompanying acute and chronic nephritis, which is clinically quite distinct.

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[5] Young, Hugh H.: The Cure of Unilateral Renal Hematuria by Injection of Adrenalin through a Ureter Catheter, The Journal A. M. A., May 18, 1907, p. 1654

[6] Barringer: Am. Jour. Urol., May, 1912.

ABSTRACT OF DISCUSSION

Dr. J. R. Caulk, St. Louis: There has been a growing tendency to attribute many of these cases of renal bleeding to nephritis, and I was glad to hear Dr. Braasch condemn this and also to hear him advocate conservatism in treatment. There is no disease—if we may call it a disease—which requires more careful diagnosis than this.

Two cases within the last year have exemplified this to me. Both of them presented clinical evidences of nephritis—albumin, casts, high arterial tension, and general evidences of nephritis—and both have cleared up immediately after pelvic injections of epinephrin (adrenalin). I think that we have to be extremely careful, for so many men are advising immediate renal decapsulation or nephrotomy. Before any such procedure is ever attempted, I think one should always try to eliminate the renal pelvis as a source of the bleeding by injections into the renal pelvis of epinephrin, of horse-serum, or of something of the sort.

Dr. O. S. Fowler, Denver: I should like to ask how many of the cases in which operation was refused were bilateral? In looking for casts in these cases of hematuria, we should never centrifuge the urine. If we centrifuge it we get so many blood-cells that they obscure all the casts. That was the case in a patient of mine. The examination was made by a competent pathologist who failed to find casts. He had centrifuged the urine. An uncentrifuged specimen showed casts.

Dr. A. L. Chute, Boston: It seems to me that a focal nephritis, not an interstitial nephritis, might explain some of these cases of hematuria. A patient I saw two years ago had had this bleeding for sixteen months. The hemoglobin percentage was low. I cut down on the kidney. I thought that I could feel a nodule in it, and therefore removed the kidney. It showed absolutely nothing in the way of a neoplasm, but it did show a condition that the pathologist said was nephritis. The patient had had a low blood-pressure. The nephritis followed a pneumonia. I do not see why we should not have a focal nephritis in cases in which the infection has cleared up and yet the pathologic change remains. That is my explanation of some of these cases.

Dr. W. F. Braasch, Rochester, Minn.: As Dr. Chute has suggested, we undoubtedly do occasionally observe cases of chronic renal hematuria with clinical evidences of nephritis, in which the bleeding simulates that of so-called essential hematuria. There is such a large number of cases, however, in which there is no other symptom than hematuria, in which, after years of observation, no clinical evidence of nephritis develops and in which little or no evidence of nephritis can be found on surgical exploration, that we must conclude that there is some factor other than slight histologic nephritis which causes *the hematuria*.

We had two cases that were bilateral, in both of which the hematuria was on one side at one time and on the other at another time. I should not regard a bilateral condition a contra-indication to operation, provided that the patient was not weakened from loss of blood and was otherwise normal. I never *have seen simultaneous* hematuria in both kidneys.

THE VALUE AND LIMITATIONS OF FUNCTIONAL RENAL TESTS *

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In ascertaining the functional capacity of the kidney, judicious selection of tests is the key to the maximum amount of information from the minimum expenditure of time and energy. The number of tests is now so large that it is impossible to utilize all in any individual case. It is unnecessary, moreover, since all of the available information is forthcoming at times from a single test or from a proper combination of a small number of tests. In order that the proper selection may be made, however, an insight into the value, limitations, advantages or disadvantages, peculiarities and significance of the findings, together with intimacy with technic concerned, is essential.

Renal functional capacity is usually ascertained in one of two ways: first, by tests of excretory capacity through the quantitative determination of various substances in the urine—dyes, methylene blue, indigocarmin, rosanilin, phenolsulphonephthalein, other chemicals—potassium iodid, lactose, sodium chlorid, urea, sugar following phloridzin and the enzyme diastase; secondly, by tests of retention through the quantitative determination of the concentration of certain substances in the blood, ions through electrical conductivity, molecules through cryoscopy, urea, incoagulable nitrogen and cholesterin.

Other tests have been proposed and advocated, but they can be absolutely discarded without loss in functional studies. On account of the approximate parallelism in the excretion of the members of the dye group, only one need be employed, and on account of its proved superiority, the phenolsulphonephthalein should be selected. Of the other excretory tests, certain ones prove of value in relation to certain types of renal disease, as will be later indicated.

Concerning the tests of retention:

The recent work of Folin and Dennis[1] indicates that the concentration of urea 0.5 gm. and of total incoagulable nitrogen 0.6 gm. per liter, heretofore considered normal, must no longer be so considered, since in sixteen strictly *normal* persons the highest non-protein nitrogen which they found was 26 mg. and urea nitrogen 13 mg. per 100 gm. blood. Slight nitrogen retention may apparently occur in *many* diseases; but in our experience in a large number of cases during the older methods and also Marshall's new urea method, we feel that no great prognostic significance is to be attached to concentrations less than 0.55 gm. per liter. Greater concentration than this together with a serum freezing-point lower than —0.6 are of the greatest prognostic importance. Evidences of retention reaching this degree we refer to as cumulative phenomena.

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* Read in the Section on *Genito-Urinary* Diseases of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

*From the Genito-Urinary *clinic of the* Johns Hopkins Hospital and the Pharmacological Laboratory of the Johns Hopkins University.

1. Folin and Dennis: Jour. Biol. Chem., 1910, iv, 29.

In order to make evident the peculiarities in value and limitations of these various tests it is advisable to consider them in relation to three great types of renal diseases: (1) unilateral and bilateral diseases necessitating ureteral catheterization; (2) bilateral surgical diseases secondary to obstruction in the lower urinary tract, and (3) medical diseases of the kidney.

1. In the first group it is desirable to have information in regard to three phenomena: (*a*) the total or combined renal function without ureteral catheterization; (*b*) the relative function, and (*c*) the absolute functional value of each kidney.

The phenolsulphonephthalein test is incomparable so far as total function is concerned and gives information frequently unavailable from any other source. In cases in which leakage and inhibition are absent, it furnishes in itself all of the necessary information in regard to the function of each kidney. In cases in which its excretion is markedly decreased, one or another of the retention tests should be employed.

The employment of functional tests in association with urethral catheterization is attended with two great difficulties which in certain cases make it impossible always to obtain all desirable information from any one test, namely, inhibition of function and leakage around the ureteral catheter.

Any discrepancy due to inhibition can be detected readily through the determination by phenolsulphonephthalein of total renal function without ureteral catheterization. Unfortunately the inhibition is not always equal on each side and one under such conditions is not justified in accepting the phenolsulphonephthalein or total urea from each side as the true index of the relative value of the two kidneys. In this connection, diastase and urea percentage, together with a difference in the intensity of urinary pigment and a consideration of the total phenolsulphonephthalein, are of value. Indeed, it is in this connection that urea percentage finds its greatest usefulness.

In order to obtain an accurate quantitative estimation of the function of each side it is necessary to secure complete collection of the urine. By the use of Albarran's flute-end catheter this is usually possible. In a certain proportion of cases, especially in patients with relaxed ureters, leakage does occur and sometimes in amounts sufficient to nullify the findings. Unless one repeats the catheterization, which is not always practicable, using the Garceau catheter on one side with transvesical collection on the other, knowledge of the relative functional values must be largely obtained from urea percentage, diastase and time of appearance of the phenolsulphonephthalein.

The peculiar value of urea percentage and diastase can be briefly stated. When inhibition occurs, the urea percentage and diastase have equal significance, but when secretion is free and leakage occurs, diastase is more reliable since it is not so readily affected through dilution. Phloridzin has proved of comparatively little value in our experience and adds practically nothing to the information obtainable from the other tests.

2. In the bilateral surgical diseases secondary to obstruction in the lower urinary tract, information concerning the total function alone is necessary. So far as execretory function is concerned only the phenolsulphonephthalein test is necessary. It is capable of differentiating between those cases with severe renal damage and those in which the involvement is slight. It is further capable of demonstrating a marked improvement in the renal condition following appropriate preliminary treatment and enables the surgeon to determine the cases suitable or unsuitable for operation and to select the most favorable time for surgical intervention. The urine output, urea and total solids may be practically normal, and yet the patient may be on the verge of renal failure which will certainly be precipitated by a radical surgical interference.

Other tests, most of them of recent introduction, have likewise proved of but little value. Lactose fails to appear at all in the majority of these cases, in this respect, closely resembling the absence of glycosuria following the administration of phloridzin. From either of these tests an exaggerated idea of the functional derangement is almost invariably conveyed.

Diastase usually indicates decreased function when it exists, but is not a reliable index to the extent of the functional injury. It yields no additional information and consumes more time than a phenolsulphonephthalein test and hence can be discarded.

In this group of cases, tests of retention are of great importance and one of them at least should be employed in every instance in which the phenolsulphonephthalein excretion is low. They all carry about equal significance, although the parallelism of the findings has not been sufficiently investigated. Urea and total incoagulable nitrogen parallel each other, so that only one need be employed, preferably urea determined by Marshall's method. It would seem probable that the blood-urea will furnish earlier evidence than cryoscopy. There have been three cases in our studies in which a high urea blood-content was present with a normal or practically normal freezing-point. In all three, clinical and other functional studies indicated severe renal damage. In one of these cases, with evidence of rapidly decreasing renal function, the freezing-point subsequently decreased proportionately, but the first indication of cumulative phenomena was furnished by the urea.

3. Studies of renal function in medical cases fall into two great groups: (*a*) those attempting to differentiate between tubular and glomerular involvement, and (*b*) those attempting to determine total function.

The glomerular function, according to Schlayer, is indicated by the excretion of water and lactose and that of the tubules by salt and potassium iodid. Lactose and potassium iodid both being substances foreign to the body and hence not so easily influenced by extrarenal factors, were considered to be more reliable indices than water and salt.

Schlayer and his co-workers, from their studies with lactose, water, salt and iodid tests, have attempted to divide nephritis from a purely functional point of view into four groups, namely, purely vascular, vasculotubular, tubulovascular and purely tubular. This classification has not been adopted by us for the following reasons: The evidence to be found in the literature for the assumption that lactose is chiefly excreted through the glomeruli is not convincing, and experiments carried out on the frog's kidney have demonstrated beyond doubt that the tubules are capable of excreting lactose. Our studies have led us to the conclusion that the potassium iodid test as used by Schlayer, in which he has placed greatest confidence for indicating tubular functional capacity, is unreliable. We have not encountered any cases of pure tubular nephritis. When both systems are involved, we do not feel that the tests can determine whether the tubular or vascular injury is preponderant. Mild passive congestion alone in many instances produces the same functional picture which Schlayer describes as characteristic of vascular nephritis. Consequently, a combined functional and clinical study is essential in order to differentiate two functionally similar but clinically different conditions.

At present so little is positively known or proved concerning the specific function of any individual part of the kidney that any attempt of the kind mentioned to divide nephritis is premature. Fundamental work in the physiology, involved in the secretion of substances by specific parts of the kidney, rather than the building up of a clinical superstructure on a questionable physiologic foundation, is more likely in our opinion to lead to a deeper insight into nephritis.

TOTAL RENAL FUNCTION

Doubt no longer exists concerning the ability of tests to reveal the total functional value of the kidneys. After attempting to correlate clinical and pathologic findings with the results of functional tests as simply and comprehensively as possible, the medical cases have been divided as follows: (1) cases clinically suspected of nephritis, but exhibiting practically normal renal function; (2) mild cases of nephritis without cardiac decompensation; (3) advanced nephritis without cardiac decompensation; (4) cardiorenal cases, and (5) chronic passive congestion in cardiac cases unassociated with nephritis.

In the first group, all of the tests showing a normal function, reconsideration of diagnosis becomes necessary. In cases of mild nephritis without cardiac decompensation, a normal or practically normal phenolsulphonephthalein is sometimes encountered, together with a delayed lactose excretion. These cases Schlayer would consider as a vascular type of nephritis on account of the delayed lactose excretion and the presence at times of a vascular hyposthenuria, as indicated by the study of salt and water metabolism. An identical functional picture as regards phenolsulphonephthalein and lactose may, however, be encountered in mild passive congestion of the kidneys. The lactose test may be accepted as an index of vascular disturbance, but a decreased lactose does not necessarily mean a glomerular nephritis. With a normal phenolsulphonephthalein output, tests of retention are not necessary.

In cases of advanced nephritis, the phenolsulphonephthalein is decreased, according to the severity of the lesion. Lactose is invariably delayed in this group of cases and its total suppression is of considerable prognostic significance, in contrast to its lack of prognostic value in obstruction in the lower urinary tract.

The salt test should be utilized in all severe cases, whether edema be present or not, in order to determine the capacity of the kidney to excrete salt as well as the effect on the quantity and concentration of the urine, but it should be used cautiously. The total diastatic content of the urine is usually decreased, but the extent of its decrease is not always proportional to the amount of functional injury. In all cases of severe nephritis, one or more of the tests of retention should be employed, their findings, together with the phenolsulphonephthalein, being depended on for prognostic indications. Cumulative phenomena are frequently encountered and, when present, add to the seriousness of the prognosis.

In cardiorenal cases combined functional and clinical studies are necessary in order to determine the relative responsibility of the heart and of the kidneys for the existence of the symptom-complex. Repetition of the tests is almost invariably necessary. In the presence of severe clinical symptoms, the finding of a good phenolsulphonephthalein output, along with the absence of cumulative phenomena, point to the heart as the responsible factor.

Low phenolsulphonephthalein output, together with cumulative phenomena, indicates a severe lesion of heart or kidneys, or both, and in any instance a serious prognosis. A low output of phenolsulphonephthalein, persisting after marked improvement in the cardiac condition, indicates serious renal disease.

In broken compensation, unassociated with nephritis, lactose is always delayed, perhaps markedly. Diastase content of the urine is low. The phenolsulphonephthalein, except in the severest types of congestion, is surprisingly good, while cumulative phenomena are practically never encountered. In cases in which the phenolsulphonephthalein output is low, with the first indication of cardiac improvement it immediately rises.

By means of these various functional tests, together with clinical studies, it is possible to obtain a much clearer conception of the renal condition than from clinical studies alone.

In severe renal or cardiorenal disease, associated or not with edema, the application of the salt test is of great importance.

It has been found that there is an exceptional type of case showing edema, albumin and casts, in which the general function is normal except for salt; indeed, a hyperpermeability may exist for other substances, the salt alone being delayed in its excretion.

The results of the test supply indications as to the amount of salt advisable in any individual case.

UREMIA

Uremia is a clinical condition, a syndrome, resulting from renal insufficiency from any cause. Its appearance is often sudden and unexpected; its course, acute and severe, rapidly ending in death; or chronic, lasting through months. Through functional studies, it is possible to ascertain that it is impending, even when no indications whatever of its proximity are revealed by the clinical study. With a continued failure on the part of the kidney to excrete phenolsulphonephthalein, lactose, etc., associated with the continuous, marked and increasing accumulation of urea or total incoagulable nitrogen or low serum freezing-point, one is perfectly safe in predicting the early appearance of uremia regardless of the underlying pathologic condition.

It must be remembered, in interpreting results of functional studies, that identical functional pictures carry very different prognostic significance in different clinical and pathologic associations. Extremely low functional capacity in chronic nephritis means death, whereas in obstruction in the lower urinary tract with urinary retention and back pressure the injury may be mostly functional or temporary, so that following appropriate treatment a fair or good capacity is again established.

Functional studies always find their greatest value when associated with careful clinical studies and, when properly employed, yield most valuable information from the point of view of diagnosis and prognosis and in the selection of the lines of treatment.

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ABSTRACT OF DISCUSSION

Dr. Louis E. Schmidt, Chicago: The only way we are going to come to any conclusions as to functional tests is by means of this comparative work of the kind which Dr. Geraghty has done. Simply to follow out the estimation with phenolsulphonephthalein is not sufficient.

Dr. W. F. Braasch, Rochester, Minn.: In my opinion, phenolsulphophthalein is the best renal functional test that we have at present. The practical value of renal functional tests, however, at least as applied to surgical conditions in the urinary tract, has not as yet been definitely determined. It is remarkable how often we see patients with prostatic obstruction who have a low phthalein excretion, even less than 15 per cent., go through an operation much better than patients with a high functional output. In fact, I do not recall ever seeing a case in which physical examination and clinical symptoms did not prove to be of greater value in determining whether or not a patient should be operated on than any laboratory estimate of renal functional capacity.

The same criticism may be made of the application of renal functional tests in the comparative estimation of the function of either kidney. With a diseased kidney on one side, a low functional estimate in the other kidney would tell us only what the functional activity of that kidney was at the time of examination, but not what it is capable of doing under corrected conditions. If the question arises, however, as to whether disease is present in one of the kidneys and if we employ the phthalein or any other functional test and get a marked diminution in the secretion from one kidney, we have evidence that disease exists in that kidney; but, if we do not get a decreased secretion, we have no positive evidence that disease does not exist. While I believe that the phthalein test is probably the best of our present functional tests, it, in common with any laboratory functional estimate, is very limited in its practical application.

Dr. John R. Caulk, St. Louis: Just one word with reference to what Dr. Braasch has said about the patient with a low output doing as well or better than those who have a high output. That, I think, is not the point. The main consideration is whether this low output is constant or not. Whether or not a man with a low output will retain it at a constant ratio under various treatment tests is a most important factor. We see persons with obstruction of the lower urinary tract, with delay in the time of appearance and marked deficiency in the total output of urine who will undoubtedly stand a prostatectomy; but we find that the output is constant. It is most important that these men have repeated tests to determine whether or not they can stand various procedures without fluctuation.

Dr. H. D. Furniss, New York: I should like to call attention to the possibility of error due to retention of the drug in these tests. I had a patient in whom the elimination of phthalein was 15 per cent. in two hours after intravenous injection; later it was 5 and again 8 per cent. In that same patient we used the lactose test and the potassium iodid test. In four hours there was cessation of excretion of lactose. That was regarded as normal. At the end of forty hours the patient ceased to excrete iodid. In all these cases a quantitative determination should be made. I think that in this case some of the lactose was retained, even though excretion had ceased. Unless we make a quantitative test we have no way to determine this. That patient had a double decapsulation, and in one week the phthalein came up to normal and has remained at that point.

Dr. Granville MacGowan, Los Angeles: Clinical experience clearly indicates to me that it is not in cases of good surgical risks that color tests are valuable but rather in doubtful cases. If you inject either indigo-carmin into a man's muscles, or phthalein into the muscles or veins, and, after a reasonable time, do not get a good show of color in the urine—a strong blue color for the carmin, in fifteen minutes, or a full rose color, within ten minutes, for the phthalein, if injected into a vein, there is something wrong with the output efficiency of one or the other kidney or of both kidneys. Almost invariably these patients will be found to have a continuous lowered output of urea and it will require well-directed effort to improve this fault, for days, weeks or perhaps months before serious surgical interference is resorted to.

Dr. Hugh H. Young, Baltimore: Those of us who have been particularly interested in the development of the phthalein test ought to explain that we feel that there is no fixed percentage that will indicate that one person is a good operative risk and another is not. There are cases which show a delayed appearance and a low percentage which are good operative risks, but these patients should be under observation for two or three weeks to determine that.

The idea that Dr. Caulk has brought out as to stability is correct. The patient has been living in the condition in which he would be after operation, and his condition is found to be stable (although the kidneys are impaired). We find quite a few patients with enlarged prostate and with low phthalein output, who remain without any symptoms of uremia. Their kidney function remains low under drainage treatment, but these patients are able to eat and go about and are quite comfortable. In these cases we feel that the condition present is a chronic nephritis and that the whole organism has buttressed itself against it and the patient will make a good recovery from the operation. It is those patients with chronic retention who have not been catheterized, and who have dilated ureters and dilated renal pelves, with low phthalein and high residual, on whom it is dangerous to operate at once. This is shown in the next few days by the rapid development of uremia after catheterization, or there will be a marked improvement, and within a few weeks the phthalein output will often be five times as good as when the first test was made, and prostatectomy is followed by no uremic symptoms. We had a case recently in which there was no phthalein excreted during four hours, and after that only a trace. That patient, after urethral-catheter drainage for five weeks, had a phthalein appearance after thirty minutes and 10 per cent. output in one hour. While he did not improve in two weeks, his condition remained stable, and he stood the operation well. You cannot give any absolutely fixed rules about this and your clinical judgment is an important deciding factor. The phthalein ought to put you on your guard and confirm your clinical observation.

Dr. H. D. Furniss, New York: I do not think that the failure of indigo-carmin to appear in fifteen minutes ought to be considered as an absolute indication of renal insufficiency. I had one case in which, after nineteen minutes, there was absolutely no elimination after intramuscular injection. After intravenous injection this patient began to eliminate it at the end of two minutes. Using phenolsulphonephthalein intravenously we obtained sixty in the first fifteen minutes after injection.

Dr. Granville McGowan, Los Angeles: I expressed myself poorly. I meant to say that, if, after an interval of fifteen minutes, when indigo-carmin or phthalein is used, a good, deep stain is not given to the urine, one had better be on one's guard about his patient.

Dr. John T. Geraghty, Baltimore: I should like to say in answer to Dr. Braasch that the determination of the renal function before any operation is valuable only in so far as it is of advantage to know anything about the renal function. If it is not necessary to know anything about the renal function, there is no necessity of doing functional tests. If, however, functional estimations give some information, and if they are of value in occasional cases, then they should be employed whenever careful work is attempted. Not infrequently information is secured in this way which can be obtained in no other manner. In double renal tuberculosis, it is not always possible to tell from the quantity of pus that is present which is the most diseased kidney. I have seen the more recently involved kidney secrete more pus than the more diseased one. A functional estimation will quickly and accurately give information regarding which is the better kidney and indicate accurately the amount of disease in each kidney. Again, functional estimations are useful in differentiating pyelitis from pyelonephritis, as in pyelitis the function is but little decreased, while in pyelonephritis the function may be seriously interfered with. From a study of the urine alone, it may not be possible to make this differentiation. This information is of value from the point of view of prognosis and treatment of cases of chronic pyelitis and pyelonephritis. If the infection is a pure pyelitis, pelvic lavage usually gives brilliant results, while in pyelonephritis the results of pelvic lavage are of only comparatively slight value. There is another class of cases whose recognition is absolutely impossible without the employment of functional tests. I refer to the infantile kidney. The urine secreted by these kidneys may be perfectly normal, but is small in amount and the presence of such an anomaly can be suspected only when functional estimations are made. Recently, we had a very striking instance of this in which a tuberculosis was present in the large, hypertrophied kidney. The function of this tuberculous kidney was six times that of the other kidney, the urine from which was perfectly normal in every respect, except that it was small in amount. These cases are probably not uncommon and it will be impossible to check them up in any other way than by a functional estimation. In the early cases of renal tuberculosis, if the disease is limited to a small area in the kidney, functional estimation may show little disturbance because there is little disturbance of function present.

One has only to glance at the literature to realize the growing interest of the medical profession in the subject of renal function and the practical unanimity of opinion regarding the value to be derived from functional studies.

THE PUBLIC HEALTH ASPECTS OF LEPROSY IN THE UNITED STATES *

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On account of the communicability of leprosy and its mutilating effects on individuals affected, the presence of the disease in any community is a matter for concern. Leprosy is known to exist in many states and in all of our island possessions. By reason of this prevalence and the enormous volume of traffic carried on between the United States and other countries, the control of the disease becomes a problem of national importance.

PAST PREVALENCE

The infection was undoubtedly introduced into the United States from abroad, but the time of its introduction is problematical. Cases were undoubtedly imported into the Gulf States by maritime routes. The disease gained access to Pacific Coast ports through Chinese immigration, and to the north central states by means of Scandinavian immigrants. In some of these sections the prevalence of the disease evidently attracted more attention many years ago than at the present time. In Louisiana, where leprosy probably had no existence 140 years ago, the number of leprous beggars in the streets of New Orleans was so large in 1786 that the authorities had to isolate them in an institution outside of the city. The introduction of the disease in these sections has resulted in its continued propagation up to the present time. Likewise, in Hawaii, where no cases were known to exist before about 1838, the introduction of the infection of leprosy was followed by its diffusion, until now the prevalence of the disease constitutes one of the great social and political problems of that territory.[1]

On account of the incompleteness of the morbidity and mortality records generally, the extent of the prevalence of leprosy in the United States in the past can not be accurately estimated. Its extent was so large, however, as to claim the attention of the authorities in New Orleans as long ago as 1786, the authorities of San Francisco in the early seventies and other states at later dates.

There is record of the occurrence of cases of leprosy from time to time in many states. Within the past fifty years the occurrence of the disease in the United States has attracted most attention in the south Atlantic states, Louisiana, the north central states and the Pacific Coast states. In 1866, the disease was recognized as having reappeared in Louisiana. In 1890, Gronvald reported the existence of sixteen cases in Minnesota, and stated that the disease had prevailed there for fifty years. He estimated the following year that about one hundred and sixty lepers in all had immigrated into Wisconsin, Iowa and Minnesota. During the ten years prior to 1883, fifty-two lepers were admitted to hospital in San Francisco.

From our more recent knowledge it appears that these sections have been foci of leprosy up to the present time. In the report on leprosy in the United States submitted by a commission of medical officers of the U. S. Marine Hospital Service the presence of 278 cases of leprosy was shown but, as stated by the commission, this did not represent a complete census. Of the 278 cases reported 145 individuals were native-born, 120 were foreign-born, and the birth-places of the remaining thirteen could not be determined. These cases were scattered through twenty-one states and territories, showing the broad distribution of the disease throughout the country. In over 73 per cent. of the cases recorded the affected persons were at large, only seventy-two being isolated and provided for by the states or cities in which they were located.

PRESENT PREVALENCE

In 1909, by means of correspondence, steps were taken to ascertain the occurrence of leprosy in the United States and its dependencies. As a result, records were obtained of 139 cases located in thirteen states and the District of Columbia, 764 in Hawaii, 17 in Porto Rico, 2,330 in the Philippine Islands and 7 in the Canal Zone. These cases, however, were only those "officially recognized," and it was regarded as altogether probable that many cases had not been included in the compilation.

In studying the regional distribution of the disease, four zones of infection could be distinguished, viz., the Atlantic seaboard, the Gulf Coast, the Pacific Coast and the north central states. In the Gulf Coast zone three foci of infection were recognized as being active. On the Atlantic and Pacific coasts a variable number of cases were occurring, and in the north central portion of the country the disease appeared to be decreasing.

By means of correspondence last year (1912), steps were again taken to ascertain the number of officially recognized lepers in the United States and its dependencies. This inquiry referred especially to the number of new cases reported during the calendar year 1911 and to the number existing Jan. 1, 1912. As a result, a total of 146 cases was reported in the continental United States, forty-one of these individuals having been apprehended during the calendar year 1911.

The total number reported necessarily represented only a portion of the cases occurring, as in many states the disease is not notifiable, and in others, the requirement of notification is difficult of enforcement.

Leprosy has been specifically made a notifiable disease in the following eighteen states and the District of

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* Read in the Section on Practice of Medicine of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

[1] New York Med. Jour., March 24, 1888, p. 322.

Columbia: Alabama, California, Connecticut, Florida, Idaho, Illinois, Indiana, Iowa, Massachusetts, Nebraska, New Jersey, New York, Oregon, Pennsylvania, South Carolina, Utah, Washington and Wisconsin. At that time the disease was also notifiable in Hawaii, Porto Rico and the Philippine Islands, and on the date mentioned there were reported in these jurisdictions respectively, 696, 28 and 2,754 cases, making a grand total of 3,624 officially reported cases in the United States and its possessions.

In Michigan, a regulation of the State Board of Health specifies that cases of leprosy shall be reported for statistical purposes. In certain other states the laws require that cases of all infectious or contagious diseases shall be reported, and among these leprosy would naturally be included. In the absence of a statement of the diseases that shall be construed to be infectious or contagious, however, it would appear to be left to the personal opinion of each practicing physician as to which diseases came properly under a classification, and were, therefore, notifiable. Under these conditions it could only be expected that the reports would be incomplete.

Although the number of cases of leprosy reported by the state authorities as present Jan. 1, 1912, was only 146, whereas, the commission above referred to found 278 in 1901, it cannot properly be inferred that there is a lessened prevalence of the disease. The 146 cases reported as present the first of last year were, with one or two exceptions, isolated and under the control of state or local authorities. These 146 cases are, therefore, probably comparable with the seventy-two cases reported in 1901 as isolated and provided for by states or cities.

From this brief summary, it is evident that leprosy is widely distributed in the United States, and, while the total number of cases recorded is trivial in relation to a total population of over 90,000,000, a public health problem of national importance presents by reason of such distribution, and the numerous possible foci of infection that exist.

FEDERAL MEASURES IN RESPECT TO LEPROSY

On account of the loathsome, contagious character of leprosy, the helplessness of persons so afflicted, and the public dread of its introduction and spread in the United States, the disease has been made the subject of consideration and certain official actions by the federal government for many years. The first object was to prevent the introduction of the disease, and on Dec. 23, 1889, a regulation was issued by the Secretary of the Treasury forbidding the entry of any vessel to any port of the United States without a certificate from the proper officer that no case of leprosy was found on board said vessel, or in case one had been found, that it had been removed from the vessel and detained at the quarantine station. This regulation provided that lepers so apprehended should be permitted to depart on outgoing vessels bound to the foreign country from which the leper last sailed.

Although this regulation was superseded by others subsequently issued, practically its provisions are in force at the present time.

In accordance with the quarantine act of Feb. 15, 1893, no alien who is a leper is allowed to embark for the United States from foreign ports; and, under this law the following special regulations have been issued for observance at domestic ports to prevent the introduction of leprosy:

129. Vessels arriving at quarantine with leprosy on board shall not be granted pratique until the leper and his baggage have been removed from the vessel to the quarantine station.

130. No alien leper shall be landed.

131. If the leper is an alien passenger and the vessel is from a foreign port, action will be taken as provided by the immigration laws and regulations of the United States. And to this end the case shall be certified as a leper and reported to the nearest commissioner of immigration.

132. If the leper is an alien and a member of the crew and the vessel is from a foreign port, said leper shall be detained at the quarantine at the vessel's expense until taken aboard the same vessel when outward bound. Such case of leprosy should be promptly reported to the collector of customs at the port of arrival of the vessel, and the collector shall exact a bond from the vessel for the reshipment of the said alien leper on the departure of the vessel.

The immigration laws forbid the landing of immigrants afflicted with loathsome, contagious diseases, leprosy being included in this class. Adequate authority thus exists for the exclusion of leprous individuals, but on account of the long period of incubation of the disease and its extreme chronicity, the possibility of the entry of cases must be admitted.

Fortunately, however, the immigration laws provide that any alien afflicted with leprosy may be deported at any time within three years after the date of his arrival, provided the disease existed prior to landing. The federal government is thus able to exercise authority over leprous aliens for three years after their arrival, and, by deportation, to relieve the state of the burden of their care.

Under the quarantine act of Feb. 15, 1893, the federal government through the Public Health Service also exercises jurisdiction over the transportation of lepers in interstate traffic. In a regulation of June 24, 1909, issued in accordance with this law, authority was granted for the acceptance of lepers for transportation under proper supervision when *en route* to a seaport for deportation or to a designated place for care and treatment, the observance of proper sanitary precautions being required while *en route*.

In a regulation of May 15, 1912, common carriers are prohibited from accepting for transportation in interstate traffic any person afflicted with leprosy until a permit has been obtained from the Surgeon-General of the U. S. Public Health Service describing the restrictions that shall be observed. This regulation which was issued by the Secretary of the Treasury also prohibits lepers from accepting transportation in interstate traffic until the permits above mentioned have been obtained, and unless such lepers shall have agreed in writing to comply with the restrictions specified. The regulation further provides that lepers who have left the state where they reside may be detained and returned to such state, or removed to such federal quarantine station as the Secretary of the Treasury may designate, the conveyance occupied by them during such removal to be closed after being vacated, and disinfected.

From the foregoing it will be seen that control has been exercised to prevent the introduction and spread of leprosy. The leprosy problem, however, relates more particularly to the care and segregation of the cases that are discovered from time to time in different parts of the country, and who are in reality under the jurisdiction of the state authorities.

As previously stated, efforts were made in 1901, 1909 and 1912, to determine the number of such cases. These investigations and the hardships experienced by lepers on account of the morbid dread of the disease on the part of the public generally, have emphasized the need of a rational and humane method of care of persons so afflicted.

In his annual report of 1891, the Surgeon-General of the Public Health Service advocated a national leper hospital to be maintained by the federal government for the care of these unfortunates. The circumstances giving rise to the need of such an institution were strikingly set forth by the president of the Pennsylvania State Board of Health as long ago as 1890 in the following words:

> It is the consensus of opinion that persons suffering from leprosy, on account of its peculiar nature, its chronic character, and the abhorrence with which the public view it, should be removed from society and humanely cared for and treated in places especially set apart for this object. It is impracticable for towns or cities, or even states to provide such places, on account of the expense, the number of cases not being large enough to warrant the necessary expenditure. And what is finally to be done with the lepers that are now ill provided for, and those that will be discovered in the future? They cannot be treated in general hospitals except for a very limited time. It is difficult to return them to their native countries, though most of them are unnaturalized foreigners. Where there are hospitals for contagious diseases (and few places have such hospitals) temporary provision might be made for them. Here they must necessarily be secluded in unfrequented apartments, denied intercourse with relatives and friends, shut out from the world, denied the freedom of outdoor exercise because of the popular aversion to the disease, and doomed to a life of suffering, and, what is worse, of mental anguish over their deserted and hopeless state. What is to become of lepers who may happen to be discovered in places which have not even such inadequate means for detention?

Practically the same situation and the questions arising from it exist to-day. Federal, state and municipal health authorities have for years urged the establishment of a national leper home. In 1905, a bill was introduced into both houses of congress to provide for such an institution for the segregation and care of lepers by the U. S. Public Health Service. The bill was passed by the Senate and favorably reported by the House Committee on Interstate and Foreign Commerce, but failed of passage in the house, presumably because of the fears of certain members that the institution might be located in their state.

Objections have arisen to the care of lepers even at federal quarantine stations, and officials have demanded the removal of cases to some other place outside of their state.

The reasons which prevented legislation and which demand removal of lepers as above mentioned will be powerful factors in the postponement of provisions for the federal care of lepers. Nevertheless, humane segregation is necessary, and ultimately will have to be provided if the states are to be relieved of a burden, and the extension of the disease prevented. In the meantime the Public Health Service is studying leprosy with the hope of evolving methods of prevention and cure, and the states and territories will necessarily provide such care and treatment as is possible.

INVESTIGATIONS OF LEPROSY

By an act of March 3, 1905, Congress provided for the investigation of leprosy with special reference to the care and treatment of lepers in Hawaii. In accordance with this provision, a leprosy investigation station was established on the island of Molokai, and a branch station located in connection with the Leper Receiving Station at Honolulu. The bacillus of leprosy has been cultivated there, and Clegg, who discovered first a method of growing the organism, is now there studying the products of the organism and its influence on man and the lower animals. Epidemiologic and clinical studies are also being carried on, and these investigations will be continued until definite results are obtained.

The work is in charge of Dr. G. W. McCoy of the Public Health Service.

STATE PROVISIONS AGAINST LEPROSY

The leprosy problem has been as difficult for the states and territories as for the federal government. The disease is mentioned in the laws of eight states, the District of Columbia, Hawaii and Porto Rico, and the regulations of the state boards of health of sixteen states. In practically all reporting and segregation of cases is required, but there is considerable difference in the methods employed.

In Minnesota, self-isolation in the home is required. In Louisiana, on the other hand, every known leper is required to become an inmate of the leper home located in Iberville Parish. Massachusetts maintains a leper colony on Penikese Island, and the city and county of San Francisco maintains a leper hospital on the outskirts of that city. In other states in which lepers are domiciled quarantine is maintained either by state or local authority. In Hawaii, Porto Rico and the Philippine Islands leper colonies are maintained, and segregation is more or less effectively enforced.

In Texas, $40,000 was set aside in 1909 for the erection and maintenance of a leper home, but on account of opposition of localities to its erection, nothing has been done. This is a striking example of the aversion on the part of the public to lepers and the difficulty of providing for their care. In consequence of such difficulties, the occurrence of cases in some jurisdictions has been purposely ignored, while in others they have been driven or allowed to depart to some other state.

On account of the recent notoriety attending the transfer of a leper from Washington to New York, the attitude of the latter city in respect to such cases is generally known. Although its population is congested, and presumably good opportunities would be afforded for transmission, segregation is not practiced.

THE POSSIBILITY OF THE SPREAD OF LEPROSY

By some the presence of leprosy here and there in the United States is held to be of little consequence in comparison with the occurrence of other diseases, such as tuberculosis and typhoid fever. Nevertheless, it is a menace to the public health and deserves special consideration because of the possibility of the spread of the infection, the hopeless nature of the disease and the aversion of the public to persons so afflicted.

While the spread of leprosy in recent years has not been marked it must be remembered that cases of the disease have developed from time to time in American-born persons, some of whom had not been outside of the United States. Of the 278 lepers recorded in 1901 and previously referred to, 145 were American-born. By reason also of our increased world relations, and interests in the Philippine Islands and other possessions, there is greater danger than ever to fear the introduction of leprosy by returning American citizens.

Large numbers of soldiers, sailors and civil employees spend prolonged periods abroad, particularly in the Philippine Islands, where there is decided danger of contracting the infection. The disease may not manifest itself on these persons for years after their return, but new foci of the disease may thus be created.

In considering the epidemiology of leprosy, the incubation period and duration of the disease must be reckoned in years and in decades rather than in days and months. The incubation period is prolonged, and the duration of infection extends throughout the life of the patient.

These facts taken in connection with our knowledge of the rise and fall of epidemics in the past suggests the possibility of a greater prevalence of the disease fifty or one hundred years hence, unless appropriate preventive measures are instituted and enforced.

MEASURES OF CONTROL NECESSARY

Leprosy should accordingly not be regarded as a negligible factor in public health administration, nor should it continue to be an object of unreasonable aversion on the part of the public. Education is necessary to overcome the latter. Public health officials and physicians, therefore, should systematically teach the people the nature of the disease, the extent of its contractibility and above all the humane treatment that should be accorded lepers.

Every case of leprosy should be promptly reported to the proper health authority and, wherever necessary, the laws should be so amended and penalties provided for non-observance.

All lepers should be segregated in such manner as to prevent the spread of the disease, but the necessary segregation should be enforced so as to promote the comfort and happiness of those so afflicted.

On account of the difficulty of providing these conditions in towns, counties and states where single cases of leprosy occur, and because of consequent inadequate methods of control, I believe there should be established under the Public Health Service a national leper home for the care and treatment of such cases as may be turned over by state and local health authorities for the purpose.

CLINICAL ASPECT OF LEPROSY *

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Our medical text-books tell us that we have many lepers in this state and that they are immigrants from the Scandinavian countries, particularly from Norway. Our lepers are gradually dying out and there are not enough left for clinical demonstration even if all were at hand at this meeting. A few cases will give us only a faint idea of the clinical aspect of this exceedingly varying disease with its different forms, many stages, all possible degrees, irregularities, asymmetry, complications and great variability in the final mutilations. One case is not like another and a complete clinical demonstration would mean hundreds—and we have not got them.

As everyone knows, leprosy appears in two clinically different and, when developed, sharply defined forms. In both forms, a macular cutaneous eruption is the first symptom—the initial lesion, which probably exists, having never been discovered—and in this stage it might be questionable which special form of leprosy will develop. This prodromal or eruptive stage is not seen in the leproseries, where the patients come when the disease is fully developed and recognized. People familiar with the disease in districts where it is endemic, will observe a change in the attitude of the patient, who is stupid, drowsy, feverish, depressed, disinclined to work, complaining of general malaise, pains in the limbs and soreness. The face, particularly the region of the superciliary ridge, is puffy and assumes a dusky hue, especially noticeable during changes of temperature. A dirty yellowish discoloration of the circumcorneal part of the sclera, which together with the cutaneous eruption gives the patient a melancholy, sorrowful expression, has always in leprous districts been regarded with suspicion by the people. When the cutaneous eruption is well established, it is usually easy to know which form of leprosy will develop, and this is a matter of no small importance to the sick, as in one form of the disease life is much shorter, the patients suffer much more and are less frequently, if ever, cured than in the other form.

Authorities on the subject have in vain tried to find a short, concise and descriptive name for all the different phases of the disease, but they have not even succeeded in agreeing on a universal name for the two groups or forms of leprosy. Boeck and Danielssen's "elephantiasis graecorum tuberculosa," "anesthetica" and "tuberculo-anesthetica" or "mixta" have by Hansen and Looft been supplanted by "lepra tuberosa" and "maculo-anesthetica," which at present are the official names in Norway. Bidenkap prefers "lepra tuberosa" and "lepra nervorum." In my writings I have used the names "tuberous" and "macular" leprosy. All these names are inadequate and also immaterial, if we only keep the two forms separate as clinically very different. In Norway it is customary to speak about nodular and smooth leprosy—*knudet og glat Spedalskhed*—which after all, may be good practical names. Mixed leprosy should be stricken out, as the two forms never appear simultaneously in the same person from the beginning. It is not rare that either form ultimately is transformed into or complicated with the other form; the disease never originates as mixed leprosy.

TUBEROUS LEPROSY

Tubercular or tuberous leprosy begins with an eruption, gradual or acute, of usually not very distinct, pigmented spots of variable size without perceptible infiltration. Livid in the beginning, they assume, after a while, a brownish color. In contradistinction to the spots in macular leprosy, these spots are not sharply defined, neither do they appear in exactly the same locality, although the face, the eyes, ears and the extremities are places of predilection for the eruptions in both forms. It can be laid down as a rule, to which there are few exceptions, that eruptions in the tubercular form do not attack the scalp, the trunk, the sexual apparatus, the palms of the hands and the soles of the feet.

After the stage of eruption comes gradually the stage of diffuse or nodular infiltration of the spots—the formation of lepromas, which name designates the leprous products, wherever they are, in the skin, the subcutaneous tissue, the eyes, the mucous membranes, the nerves, etc. The skin covering the lepromas becomes dense and glossy; the consistency of the lepromas is solid, the shape being usually that of a globe cut in half, sometimes oblong.

The size varies from a couple of millimeters to extensive masses, when they become confluent; the color varies from reddish, yellowish to brownish and even to black. The lepromas do not itch and are indolent except in acute eruptions. At the site of the lepromas the hair will fall out and the sudoriferous and sebaceous glands will atrophy. When the tuberous lepromas in the face are numerous, large and confluent, with furrows between them, we have the so-called *facies leonina* (lion face). Otherwise we find all degrees both as to extensiveness and intensity. Hansen and Looft mention that they have seen lepromas so small, discrete, few and so little characteristic, that the diagnosis had to be made by microscopic examination of an excised piece. Sometimes lepromas in the skin cannot be seen but may be felt, when they extend into the subcutaneous tissue instead of outward. Therefore, palpation of the skin is just as necessary as inspection.

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* Read in the Section on Practice of Medicine of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

The lepromas in the skin, when once developed, will for the most part remain stationary for years; they grow but little if any at all. Sooner or later, however, this slow development is interrupted by more severe outbreaks, the so-called eruptions. The eruptions, which Hansen and Looft look on as a result of auto-infection, mean an acute outbreak of new lepromas in the old as well as in new places. The general health, which heretofore has been fair, suffers under high fever, general malaise and pains; the patients stay in bed from days to months. The eruptions on the extremities have a great likeness to erythema nodosum, sometimes even to pseudo-erysipelas. The disease progresses always through eruptions in shorter or longer intervals. When the eruption fever is over, the patients pick up quickly. They never die in the attacks, but they come out more leprous than before, having at least more leprous manifestations. The number of eruptions in a patient is variable.

The lepromas may grow so luxuriously that the epidermis breaks or is cast off. The exposed surfaces cause the patients great discomfort and they seek relief in plastering up the often numerous places, which are little disposed to septic infections. Erysipelas, which was endemic during my time in the leproseries, got hold of many and carried off some of the patients.

After several years the stage of diffuse or nodular infiltration is followed by a stage of absorption or ulceration. The lepromas soften exactly in the middle of the base and the surface sinks in. Or they break open with expulsion of the softened contents and an ulcer results, which finally heals with a depressed, radiating, white or pigmented scar—the leproma is healed.

The patients usually die in this stage from complications or intercurrent diseases after an average illness of eight or nine years.

Tubercular leprosy attacks the eyes in 75 per cent. of the cases—the lids, conjunctiva, cornea, sclera, iris and ciliary body, but never the inner eye. I shall not take up space by detailing the clinical aspect of the eye affections in this form, however interesting they may be; I have described them repeatedly elsewhere. I shall only direct attention to the dirty discoloration of the sclera, often found in the beginning of the disease. This, together with a faint obscuration of the upper part of the cornea and the already mentioned dusky hue of the region of the superciliary ridge are early and sure symptoms of advancing tubercular leprosy. Blindness from invading corneal lepromas and leprous iridocyclitis is not uncommon. It is a consolation to the misery, that the advance of the corneal lepromas can be arrested for a long time by establishing a scar between the leprous and the clear cornea by performing a keratotomy. Finally, however, if not absorbed, the lepromas will transgress the scar and blind the patient.

The tubercular leprosy may also attack the mucous membranes of the nose, mouth, tongue, pharnyx and larynx. Only the anterior soft part of the nose is affected. The septum may ulcerate and the tip of the nose will sink in. The soft part of the nose may disappear entirely, leaving a cavity. The bony structures of the nose are never affected. Lepromas are often found on the mucous membranes of the lips, the mouth, the soft palate, the pharynx, epiglottis, larynx and vocal cords. Tracheotomy is not a rare operation in these cases. Many patients carry a tracheotomy tube and are not worse off for it, as they already were incurably aphonic.

The lymph-nodes are always enlarged. The swelling is indolent and never suppurating.

The peripheral nerves are always affected in this form of leprosy—not from the beginning, but always in the later course of the disease. The facial, radial, median, ulnar and peroneal nerves are always invaded. The lepromas of the nerves are palpable at places of superficial exposure; of the median nerve at the wrist, of the ulnar nerve at the inner condyle, of the peroneal nerve where it swings around the head of the fibula. Pains, intense pains, requiring relief by morphin hypodermatically, and anesthesia result from the leprous neuritis. Anesthesia is not so marked as in the maculo-anesthetic form, but can usually be easily demonstrated in the peripheral parts with the advancing disease.

The tubercular leprosy also attacks the testicles, the liver and the spleen. These affections have only pathologic interest, however, and are of no clinical significance whatsoever.

A tubercular leper rarely, if ever, recovers; it happens oftener, if he survives the different stages and all lepromas have disappeared, leaving scars and other deformities, that he turns into a pure anesthetic leper with mutilations as the final stage of the disease. The lepromas of the nerves are the last ones to disappear and if they do ever disappear, the vitality of the nerve itself has disappeared with them but, fortunately, never completely.

The clinical aspect of this form of leprosy is too characteristic for diagnostic errors. If ever in doubt, examine for lepra bacilli, which is easy, as they are always present and in great numbers in all lepromas. No other disease should ever be confounded with tubercular leprosy.

MACULO-ANESTHETIC LEPROSY

It seems strange that the same germs in the same locality can produce two distinctly different forms of leprosy, the one having no external resemblance whatsoever to the other. Lie, Hansen's successor in Norway, intimates that the difference between the tubercular and maculo-anesthetic forms consists in a greater wealth of lepra bacilli in the first and a greater reaction to the few bacilli in the last form. The result is that the erythematous eruptions in the first form go on to lepromatous infiltrations, while the erythematous eruptions in the second form gradually fade away. In the nervous system, the difference is not so conspicuous, but the proportionately few bacilli here, the complete disappearance of the bacilli in some cases, the intense neuralgias and the deposits of lime salts in the nerves are indicative of the same condition here as in the skin; fewer bacilli and greater reaction.

The initial lesion, if such exists, has not yet been found. There are indications that the mucous membranes of the nose where lepra bacilli often are found in the secretions, might at least be one of the places where the bacilli get entrance to the system through inoculation in nose-picking or otherwise. But, to quote Hansen: "the greater the ignorance, the livelier the imagination."

Although there are a few cases on record in which no cutaneous eruptions ever were observed, the claim is general that maculo-anesthetic leprosy is always ushered in with an eruption of isolated, erythematous spots which, in contradistinction to the tubercular form, may be found in any locality with the exception of the scalp—on the face, on the cornea, along the course of the spinal nerves. The maculae are of different sizes, from 2 to 3 cm. in diameter to much larger. They are reddish at first, become more and more pigmented and after a while are yellowish to brownish. Their form can be round, oblong, irregular or annular; their margins are sharply defined; they are either flush with the skin or plainly elevated, sometimes desquamating and always hyperesthetic to begin with, anesthesia being a later symptom. The maculae may spread, become confluent and form landscape-like figures. A rather symmetrical distribution is the rule, from which there are many exceptions. The maculae will last from a few days, even less, to several months. They fade from the center toward the periphery, leaving for a time annular forms; they can disappear entirely without leaving perceptible marks or they can leave behind more or less anatomic changes, demonstrable so long as the patient lives; in some cases the skin may become entirely atrophic, transparent, and thin as a cigarette paper. New eruptions may follow at later periods either in the old or in new places.

Swelling of the lymph-nodes is usually present and will remain long after the eruptions have disappeared.

With gradual disappearance of the cutaneous eruptions the leprous neuritis, which progresses from the superficial nerves of the maculae toward the center and later as degenerative neuritis toward the periphery where there never was any eruption, will predominate in the clinical aspect. Maculous leprosy gives way to anesthetic leprosy and the anesthesia is the key to the situation.

Lie, who has made extensive and excellent studies of the leprosy in the spinal cord and the peripheral nerves, finds that leprous polyneuritis is of two kinds; the neuritis of the peripheral parts of the nerves is at a certain stage of the disease due to the presence of lepra bacilli, while the neuritis in the most central parts of the nerves, where no bacilli could be found, must be of secondary, degenerative nature, resulting from the influence of the lepra bacilli on the peripheral nerve-ends. When the bacilli first have invaded the nerves, the leprous process proceeds with more or less rapidity toward the central nervous system. The advance of the bacilli stops as a rule about the middle of the arm in the ulnar nerve; still more peripherally in the median and radial nerves and in the middle of the thigh in the sciatic nerve. On this leprous stretch the nerves are thickened and can be felt, where they are superficial, particularly at the inner condyle of the humerus and at the head of the fibula.

Lie found the changes in the more central parts of the nerves where bacilli never were found, less pronounced than in the peripheral parts, but always in proportion. The degenerative changes were characteristic by the absence of that hypertrophied connective tissue, which accompanies the lepra bacilli and by the presence of very thin nerve-fibers, which he considers atrophic, the nerve trunks becoming thinner than normal as a result. These degenerative changes can be traced clear to the roots on one side and to the periphery on the other side—descending degeneration along the nerves, which were not invaded by the lepra bacilli. The anterior roots were, however, undoubtedly less affected than the posterior.

Lie found the spinal ganglia seldom normal. He found hyper-pigmentation in the ganglion cells; the nuclei had often disappeared and the protoplasm presented different degrees of tigrolysis and pyknosis. Bacilli were found in nearly all the tubercular cases and in a great number of the anesthetic, partly in normally appearing ganglion cells, partly in degenerated ones. Lepra bacilli were rarely found in the tissue outside the ganglion cells.

In the gray substance of the spinal cord Lie found changes analogous to those in the spinal ganglia, only less pronounced and with fewer bacilli. The most constant changes were found in the white substance, particularly in the dorsal columns and the posterior roots, whereas the spinal cord seems to be a less favorable bacilli.

He also found bacilli in the central nervous system in all cases where he found them in the periphery. He considers the central nervous system a place of predilection for the bacilli, particularly the spinal ganglia, whereas the spinal cord seems to be less favorable domicile.

The leprous and degenerative changes in the spinal cord do not, as heretofore believed, belong to the anesthetic form of leprosy alone; they appear in all somewhat older forms—even typically tubercular—when the peripheral neuritis has reached such an advanced stage, that we can demonstate anesthesia and atrophy in the periphery.

CLINICAL ASPECT OF NERVE LEPROSY

The patients are more or less tortured by neuralgias, generally present in the extremities and usually of sufficient severity to justify hypodermic relief. We had in my time many morphin habitués.

Anesthesia is a constant and the most characteristic symptom. It may proceed to complete loss of the tactile and thermal sense. Anesthetic areas are generally found on the forearms and hands, on the legs and feet, on the trunk and on the face and eyes. They are usually demonstrable at the site of the eruptions, but will also be present in parts supplied with degenerated nerves.

Vesiculation or pemphigus eruption is characteristic for this form of leprosy, but is absent in the tubercular form. Vesicles are sometimes present in the beginning of the disease simultaneously with the cutaneous eruption; ordinarily they appear when the anesthesia is well developed. Vesiculation is considered a trophoneurotic symptom. It is to my mind questionable if vesiculation is not often the result of traumatism, such as exposure to protracted pressure or intense heat, the patient not being able to control either because of the loss of sensation. Whatever may be the cause, vesiculation often comes on suddenly; the patient wakes up with one or more bullae. The contents of these bullae are serous and devoid of lepra bacilli. They usually burst soon and the places heal with first, a pigmented, later white scar. Sometimes septic infection sets in, deep ulcerations following. This is particularly seen on the hand and under the ball of the foot (*mal perforant de pied*).

Acute rheumatic affections of the joints, not seldom observed, are also regarded in the light of trophic disturbances, although they may be explained as metastatic affections. The joint affections belong to the earlier stages of the disease, appear mostly simultaneously with the maculous eruptions and disappear with them. They may repeat themselves and leave some stiffening of the joints.

Other trophic disturbances in advanced cases are edematous, pale glossy, slightly desquamating, atrophic skin (white leprosy) devoid of hair, sudoriferous and sebaceous glands; in old cases, hyperkeratosis has been observed, usually symmetrical, on the anterior aspect of the crura, on the backs of the hands and the soles of the feet. Malformations of the nails, which become either thickened or brittle, fissured or thinned and decreased in size, are also trophic manifestations.

Atrophy of the subcutaneous tissues, the muscles and the bones are constant manifestations and are looked on as trophic disturbances. The muscular atrophy might, however, result from inactivity due to progressive muscular paresis. This muscular paresis and atrophy run parallel with the progressive anesthesia.

In the stage of resorption, which after many years follows the stage of eruption and leprous neuritis, the disease may clear up and a practical cure be effected with more or less complete return of sensory and muscular activity, but sclerosis of the nerves is the usual result, after all the leprous products, including the bacilli themselves, have disappeared, and permanent anesthesia with all its sad, often extremely pathetic consequences, will follow. The leprosy is cured, but the cure is dearly bought on account of many horrible mutilations such a cure so often brings. This is the final stage in many cases—the stage of mutilations (lepra mutilans), which might cover many years, until complications or intercurrent diseases end the miserable existence.

The facial and trigeminal nerves are almost constantly affected but seldom to the same degree. Paresis and atrophy of the muscles of the face and anesthesia of the eyes will produce a very characteristic clinical picture. The face loses its expression and mimic, winking becomes more seldom and the look is sorrowful. It may happen that the masseters become so lame and atrophic, that the lower jaw sinks and has to be held up artificially. Paresis of the orbicularis oris causes ectropion of the lower lip, with difficulty or even impossibility of closing the mouth, while the saliva constantly dribbles away. Paresis of the ocular orbicular muscles makes insufficient closure of the lids; paralytic ectropion of the lower lids with eversion of the puncta will result and cause epiphora and xerosis of the lower part of the cornea with ulceration, perforation and its further consequences unless remedied by medial tarsorrhaphy, an operation which has saved many eyes and is consequently very popular.

The motor nerves of the eyeballs are probably sometimes also affected, as the excursions of the globe might be more and more limited and even go on to complete paralysis—the bulb standing perfectly still in the middle of the orbit.

The ocular affections in anesthetic leprosy I have repeatedly described in papers and dissertations in Norwegian when engaged in the leproseries. I think I have proved to universal satisfaction, that the above-named affection in the lower part of the cornea is entirely due to xerosis and not at all to neuroparalysis.

The anesthetic eyes stand operations of magnitude as iridectomies, cataract operations and tarsorrhaphies just as well as normal eyes and artificial anesthesia is superfluous. Xerosis of the cornea may take in the entire surface and destroy the eyesight; it may also be complicated with a real leproma and followed by lepromas elsewhere.

As to the extremities, the anesthesia, paresis and atrophy will lead to most characteristic pictures. Atrophy of the interosseal muscles will make the interosseal spaces show up as furrows. The muscles of the thenar and hypothenar eminences waste away with disappearance of the natural roundness of these parts. Gradually most of the muscles of the hands will atrophy, then those of the forearms, and, lastly, even some of the arm. The corresponding muscles of the lower limbs undergo the same atrophy. The muscular paresis, however, never becomes complete. The lepers can always make good use of their hands and feet and do astonishingly clever work with their crippled extremities. They can sew, knit, spin, make nets, shoes, brushes, combs and do blacksmithing and carpenter work. And they sell their products without any ill results to their customers. Their walk is characteristic; they lift their legs with effort because of the muscular weakness.

Gradually the real mutilations appear. Contractures of the hands and feet develop. The hands become claw-like (*main en griffe*). The first phalanges are dorsally and the rest of the fingers volarly flexed. This malformation is also present in the feet, but generally to a lesser degree. But these are not all the mutilations to which these lepers are subjected. With the progressive anesthesia follow frequent and almost unavoidable exposures to injuries, infections, and ulcerations. They bruise, cut, burn or squeeze their hands or fingers very frequently; they stand on their feet so long that the circulation under the heels and balls of the feet is interrupted with resulting vesiculation, crushing of the bullae and infection; or the toes and feet are injured and infected in all sorts of ways. Purulent periostitis often results; the bones of the fingers, toes, hands and feet are laid bare and they are expelled in necrosis if not professionally removed, leaving awful mutilations.

The final result often is that all fingers are wanting on the hands; that only small, soft, disfigured prominences provided with crippled nails are left behind on the otherwise atrophic middle hand; that the toes are cast off, the metatarsal bones atrophy, and that the tarsal bones also necrose, so that the foot finally appears as a pyramidal lump or pillow at the lower end of the tibia.

Indurated ulcers on the legs, like varicose ulcers, are often observed; they heal under appropriate treatment.

The mucous membranes of the nose, mouth, throat and pharnyx do not seem to suffer and the olfactory, acoustic and optic nerves seem to remain intact. Hansen and Looft, however, claim that the senses of smell and taste may be reduced, even entirely gone in cases of very pronounced facial paralysis. I remember, though, a case in one of the leproseries in Bergen, a blind man, terribly mutilated otherwise, going around enjoying his snuff-box—his only pleasure. His hands were completely anesthetic; with his tongue, he ascertained if the snuff was there and he managed to get it into the right place. He was in all his misery a happy man—decidedly so when a "hypo" was added to his snuff.

Gastric Ulcer and the Appendix.—There is now no longer any doubt in my own mind that the commonest site of a "gastric ulcer" is in the right iliac fossa. That is to say that in the majority of cases in which the most erudite teaching of the most astute German physicians would justify or compel a diagnosis of ulcer, the patient is suffering from a lesion elsewhere, and more often than not from a lesion in the appendix. —Sir Berkeley Moynihan, Address in Surgery, Brit. Med. Assn., 1913.

THE DERMATOLOGIC ASPECTS OF LEPROSY *

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In undertaking a brief presentation of the dermatologic side of leprosy there stands out the prime question: From what point of view? To a mixed audience, not technically trained in terms of dermatology, the subject must appeal most from the diagnostic point of view, and in this apprehension of the subject a brief synopsis of salient skin leprosy is to be presented.

There is no stereotyped classification of leprosy, and even when the attempt is made to make distinctive groups of types of the disease the exceptions are more numerous than the rule.

It is easier to study the skin evidences of leprosy on the presenting lesions than to try to fix the types in which any complex of symptoms may be looked for. On this basis, then, we may speak of macular leprosy, tubercular leprosy, bullous leprosy, pigmentary leprosy, nodose leprosy, scaling leprosy, ulcerative leprosy; and as aberrant occurrences, atrophic leprosy, mutilating leprosy and papular leprosy.

MACULAR LEPROSY

Macular leprosy may occur in three forms. First, as an expression of a general impression of the individual carrying a circulating infection of the disease and its organism. Such an eruption is evanescent; it has all the characteristics of an erythema multiforme of toxic type and the eruption is not characteristic of leprosy. Here the lesions are of various sizes, bilateral and symmetric, general over the whole body, and are light red, level with the skin, fade on pressure, have no fixed pigment and may be quite hyperesthetic so far as itching, heat and hypersensibility are concerned. Such macules may disappear entirely or they may continue *in situ*, giving gradual place to infiltrated and even nodose lesions in the same areas. More often they disappear and may recur months afterward. With such evidences the general symptoms of leprosy are associated.

Macular leprosy may be pigmentary from the start. Over the buttocks, hands, face and legs, particularly, the eruption shows in reddish-brown macules, more or less rounded in outline, level with the skin, and persistent in all of these characteristics.

The true type of macular leprosy is the most characteristic. Ovoid macules, varying in size, appear on the face, over the shoulders, over the arms and forearms, over the legs, more or less scattered, edges elevated and centers depressed; often the edges are highly pigmented, brown or purplish, and the center is of normal color or even a dirty white.

The last-named macules are anesthetic; the others are not. The anesthesia is more marked at the borders. More than this, in the borders of the last-named macules, it is usually easy to demonstrate the lepra bacilli; in the first two varieties of macules, it is almost impossible to find any bacilli—arguing, as has been suggested, that the eruption is rather an exanthem than a deposit.

Macular leprosy must be differentiated from syphilis, and from erythema multiforme. From the first the macules may be easily distinguished by their preference for the extensor surfaces, by their large size and by the peculiar dusky color in the pigmentary forms. Macular syphilis is not infiltrated.

From erythema multiforme, the diagnosis is made on the more established eruption, lasting weeks or months, and in the pigmentary and infiltrated types by the fact that in both the lesions do not fade on pressure. Sometimes iodism produces infiltrated lesions resembling leprosy, but here the whole lesion is turgescent and highly inflamed, and therefore red and not dusky-brown red.

TUBERCULAR LEPROSY

The tubercle of leprosy is of two forms.

The large tubercle is found about the nose, on the chin, cheeks, in the pendulous portion of the ear and sometimes on the hands and on the legs. The color of these lesions is characteristic—brown red. They are firm, rounded masses, deep set in the skin, not uniform in size and with no tendency to disintegrate while the general condition of the patient is good. The lesions are almost invariably anesthetic.

Lupus and syphilis may be confused with this form of tubercle. In lupus the lesion is purple, granulomatous in consistency and ulcerating as soon as the tubercle is mature. The general symptoms in leprosy (nasopharyngeal and laryngeal, particularly) are ordinarily concomitant. In syphilis the tubercles are smaller, grouped in crescentic formation, and scar in ulcerating, with marked and characteristic pigmentation.

The small tubercle of leprosy is quite different. Here the lesions cluster close, like small pea-sized bits of beeswax embedded in the skin. Over the backs of the hands, the chin, the borders of the lips and the cheeks are the sites of predilection. The lesions are a dirty yellow. This type of tubercular leprosy is usually rapid in its course, presumptively because the lesions in the skin are probably only the expression of a general tubercular condition of the viscera. These lesions are likewise anesthetic.

Only xanthoma and disseminate tuberculosis need to be considered in differentiation. Xanthoma presents flat tubercles, deep seated, bright yellow, smooth and usually lissom to the touch. Stretching the skin in xanthoma shows the streaks of connective tissue in the striae of the lesion; stretching the skin in leprosy only intensifies the waxy appearance of the tubercle. Xanthoma at times is painful; leprosy is anesthetic.

Tuberculosis of the miliary form may be disseminate in the skin and may be found in the areas in which tubercular leprosy is found. The lesions are in closer formation; usually occur as smaller tubercles and usually are found about the joints rather than at the peripheral extremities. Confusion often arises in these two conditions occurring on the face, but as the organisms of leprosy and of tuberculosis can be almost always demonstrated, this method, even carried to cultural procedure, will finally decide.

BULLOUS LEPROSY

Bullous leprosy must be noted as important, particularly as it is an early form. The lesions come on the hands or feet, over the joints of the fingers, as a rule. The bullae repeatedly occur at the same spot, until finally the epidermis is lost and bullae can not form. Scarring, with mottling pigment, follows. Sometimes, necrosis supervenes and the deformity from loss of bones may result. This dermatologic evidence is really the expression of a disturbance in the nerve, usually the ulnar, along which may be found, when the bullae occur, marked thickening or even distinct nodosities along the sheath. But I am limited to cutaneous leprosy, so may not further digress.

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* Read in the Section on Practice of Medicine of the American Medical Association, at the Sixty-fourth Annual Session, held at Minneapolis, June, 1913.

PIGMENTARY LEPROSY

In some instances the local evidence of leprosy manifests itself in diffuse pigmentation of the face, neck, trunk, hands, arms and legs. At times the whole body may be so pigmented. The slight mottling is peculiar to this disease and makes the differentiation from the pigmentary evidences in vitiligo (in which the demarcation of color is abrupt), in Addison's disease (in which the pigment is solid and in selective areas), in syphilis (in which the mottling is limited to the neck) and in mycosis fungoides (in which the pigment is always cast over or under the premycotic furfuraceous scales).

NODOSE LEPROSY

Nodose leprosy is usually facial, coming on after the diffuse macular form has spread over the face and has persisted. As the skin thickens, rugosities develop and each of these separate into larger or smaller masses, forming nodes. At first there is some mobility, but this gradually disappears until a true satyriasis is established in the facies; and as the disease grows older and the skin roughens, there grows a more and more fixed condition of the skin, until the rugae resemble the thickened areas so characteristic of the lion's face and from which has been derived the term "leontiasis" as applied to this form of leprosy. Ulcers now ensue as a result of failure in nutrition, and one by one the features change by necrosis until the last stage of a fearful process may end the history of the case by death.

Hypertrophic rosacea, when general over the face, may resemble leontiasic leprosy, but at no time is the mobility lost, and the skin remains soft in spite of hypertrophy.

Chronic edema may likewise be mistaken for this disease, but in edema the smooth skin with the pitting over all areas makes a clear diagnosis, even if the complication of the keratinous changes in the eys, and the ulcerative changes in the respiratory tract were not also in evidence to proclaim a more sinister diagnosis.

SCALING LEPROSY

Scaling leprosy is rare. Here the whole skin shows signs of degenerative change, and wrinkling is seen everywhere. No part of the body is free. Thinning instead of thickening occurs, and it is not hard to find the trophic changes of the skin accompanied by like changes in the peripheral nerves and in the mucous membranes of the nasopharynx. The conjunctivae are also involved and ectropion is common. The musculatory changes in the hands are also present and the peripheral nerve changes are found at the same time as the general scaling of the body. The skin everywhere has a dirty gray color, with lines of atrophy showing through the scales. The loss of hair over the pubis, in the axillae, over the body and of the eyebrows, lashes, beard and scalp carry further the picture of the atrophic process.

Xerosis in all its forms is easily differentiated by the consistent atrophy in the leprosy of this form. In xerosis the process is as consistently hypertrophic and the more severe the scaling in xerosis the more the tendency is to hypertrophic change.

ULCERATIVE LEPROSY

Ulcerative leprosy is nearly always found as an expression of nerve destruction and located on the sole of the foot, usually under the fleshy part of the great toe; it may occur at the heel. This ulcer, "neurotic ulcer" in type, is usually one of many symptoms of nerve leprosy, but as an ulcer it shows cutaneous evidence and must be mentioned here. The cylindrical cavity, sharply outlined, rather deep, and the hard and horny edges, with the nauseating odor, are sufficient to make a diagnosis.

ATROPHIC LEPROSY

Atrophic leprosy is also of nerve origin, but with cutaneous expression usualy referred to the extremities. The whitlow, atrophy of the skin of the hands and feet, loss of intermediate phalanges resulting in superficial ulcers and in deformity, the scarring and pigmentation, all are the cutaneous evidences. Syringomyelia may be of other than leprous origin, but the altered or lost sensation, associated with peripheral lesions like the foregoing, the occurrence of contractures of the hand, of atrophy and of occasional bullae, should lead to a search for the bacilli for a differentiation.

When leprosy is advanced, all lesions may give way to degenerative changes, and tubercles or macules may break down, so that ulcerative leprosy may become general. The nasal bones break down; the lips excoriate and slough off; fingers drop; toes are spontaneously amputated; the legs or arms show areas of necrosis, and finally the terminal members one by one are made to fall until at last "the frame bears only semblance of its past, human once, but now distorted, bound in shapes fantastic and shorn of everything but form."

PAPULAR LEPROSY

In the various exacerbations of leprosy, particularly when the lesions begin to break down, when the toxins are liberated, or the masses of dead bacilli are sent into the circulation, there is frequently a rise of temperature, producing the "fever of leprosy," now recognized as an entity. With this process a general eruption appears of lenticular papules. This is the only form of papular leprosy so far known, and it is questionable if it may be properly called papular leprosy, as the papule is really only an evanescent exanthem, disappearing with the defervescence of the attack.

The papules are free of organisms and are purely exudative in type, inflammatory and hyperesthetic if the sensation is disturbed at all.

CONCLUSION

Much more might be said of cutaneous leprosy, but in the time allowed in a symposium of this sort it would be impossible to handle the subject exhaustively. The final word may be said that by learning the lesions which may be present in leprosy, it may be possible to recognize them by differentiation, while the attempt to carry pictures of classical descriptions may fail of service in the simple cases in which a diagnosis means so much in the matter of care and cure.

124 Baronne Street.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. DYER, BOECKMANN AND BLUE

Dr. H. M. Bracken, St. Paul: My chief interest is in the care of those afflicted with leprosy. Those who have to do with the handling of this disease appreciate the importance of an early diagnosis. It was said in the past that we had no American-born lepers in Minnesota. We now have a record of seven lepers born in Minnesota, four of whom are still alive. When a resident of this state becomes infected with leprosy we can attribute it to one of two causes, either a failure to diagnose the disease sufficiently early in those who are exposing others, or an unsanitary condition in the family that makes it almost impossible to prevent infection. This disease is not contracted casually; it is not picked up in the railway-cars or in the street-cars; it is a house disease. From the administrative point of view it should be easier to control this disease than tuberculosis, and yet people have the greatest dread of leprosy and practically pay little or no attention to tuberculosis. This is not reasonable. In 1900 I collected data covering twenty-seven cases in living patients in Minnesota; now we have but thirteen. From this it can be seen that the disease is gradually disappearing. All of the cases in Minnesota, except the seven already referred to, have been brought in from other countries. Many of the early cases were brought in from Norway and Sweden, but latterly from other countries, namely, Italy, Canada, the Philippine Islands, etc.

The important question is, How are we going to take care of the lepers? Dr. Blue's paper dwelt on this phase of the subject. It is not practicable for each state to maintain a leprosery. There are not enough cases to demand it. The troubles in Texas emphasize this difficulty. In this state, as a rule, we have been able to handle the cases at home. Many of the lepers are in comfortable circumstances, and when they are reported to us we simply tell them the danger to the other members of the family and recommend that proper precautions be taken to prevent infecting others. These recommendations they will gladly carry out, as a rule, for they do not want to infect their own people.

The national government should provide a leprosery; but where? Whenever this question is raised, as Dr. Blue states in his paper, a local sentiment is worked up against it. We might, of course, try to get some of those states which have made provision for the care of lepers to open the doors of their institutions to lepers from other states, on a business basis.

Dr. M. L. Graves, Galveston, Tex.: Texas has lepers. As a matter of fact, the law and appropriation had its origin in Galveston, where the larger number of leprosy cases have occurred in the state. A few years ago Dr. E. S. Cox, our county physician, collected statistics showing that about fifteen lepers had been living in Galveston at various times. Our health physician then went before the state legislature and presented photographs of the quarters of these lepers and of their distressing conditions and secured an appropriation of forty thousand dollars to erect a lepers' home. A commission was appointed by the governor, and traveled over the state of Texas, uninvited and frequently repelled by communities, until it had to give up in disgust the opportunity to establish this home.

During the eight years in which I have been in Galveston, there has hardly been a year in which I have not been able to demonstrate to my classes cases of leprosy. We have no means or methods of isolation, legally, in our state. The first case that I exhibited to my classes was that of a negro. When I saw that patient two years later at Houston, I found him in the suburbs sitting on the platform of a suburban saloon, surrounded by fifteen or twenty laborers. On account of the wide distribution of the disease throughout the United States, and the indisposition of local communities to care for these patients—the work is nowhere well done, so far as I know, except, perhaps, in the state of Louisiana, under the direction of Dr. Dyer—it seems to me that it would be best for us to endorse the recommendation of Dr. Blue and establish a federal leprosarium to take care of these people. I believe that it will be far easier to do something of that kind when we have a national department of health with a cabinet officer at its head.

Dr. Guilford H. Sumner, Des Moines, Iowa: I wish to lend my influence and my hearty approval for the establishment of a leprosery whereby the states may be relieved in cases of emergency. One evening I received a telegram from the secretary of the State Board of Health of Michigan, stating that a leper had escaped from that state and was probably located in the city of Centerville, Iowa. I immediately telegraphed a member of our board who lives at Centerville, and by 10 o'clock that night he had the man located. He had been a resident of the state of Michigan for about twenty-eight years. I was assured by the Michigan board that the state of Michigan would remove him, and I at once placed him under quarantine, as provided for in the Iowa rules and regulations, and expected, of course, that he would be removed by our sister state. Days and weeks passed, and finally I was notified by the Michigan secretary that they had no money to remove this patient, but that if we would send him home they would receive him. I at once began to take steps to return this man to Michigan, and I at that time did not consider it a very serious proposition, but, after communicating with Surgeon-General Blue, I found that I would have to remove him in a special car and send an attendant. The railway company said that they would remove the leper for eighteen fares from Centerville, Iowa, to Chicago, and for twenty-five fares from Chicago to Bay City, Mich. I inquired the cost and was told that it would be $216. Just as I was about to make arrangements to move him, the railway company told me that they had concluded that they would have to remove him by special engine and car. I again inquired the cost and was told seventy-five fares from Centerville to Chicago, and one hundred fares from Chicago to Bay City. I asked the cost and was told $1,160. I appealed to the governor and the executive council of my state to ascertain what I could do. I was told that there was no money with which to remove the leper. By that time all were anxious to have the leper removed from the state. I was at a loss to know what to do. The next obstacle was that the secretary of the Michigan Board of Health had served notice on the Michigan Central Railroad that no car or train bearing the leper would be permitted to enter the state of Michigan or stop at Bay City. The governor and executive council gave me five hundred dollars to pay expenses of moving. I employed a fellow with a big touring-car and gave him the five hundred dollars to convey the leper across Indiana and Illinois and into the state of Michigan. I obtained the consent of the Illinois board and the Indiana board. The car was fumigated and disinfected and brought back to Iowa, and my trouble ceased.

Now I do not know that this will occur again, but with a leprosery under government control I think that we might be able to turn our lepers over to the U. S. Public Health Service.

Dr. W. C. Rucker, Washington, D. C.: Very few of the national governments of Europe have any national quarantine system. If a leper went to England, the vessel would be met by the officials of the customs service, who would look over the passengers on the boat, and then notify the port physician if they discovered any disease which they considered quarantinable. He would then come and look over the suspected persons; but the preliminary diagnosis is made by a non-medical man. France has a quarantine system, but it is not a national quarantine system; it is governed by the various departments of the French government. There is no national quarantine system in Germany. I think there are four states of the twenty-six which have a quarantine and each one has its own independent system. They operate entirely independently, as a rule, but occasionally unite in important instances. I do not know what the Italian and Spanish quarantine systems are, but I do not think that they are very extensive. The United States is the only country in the world that has established a good and complete national quarantine system.

Dr. E. Boeckmann, St. Paul: When I was in Bergen I was instrumental in exporting some lepers to Minnesota, because it was the general belief that when they came over here they would do much better and not be a menace to the population, and I think that that has proved true. On the other hand, I have been instrumental in sending lepers back again, on account of my influence with Dr. Danielsen at the hospital in Bergen. I wrote him asking if he would be kind enough to receive lepers from here on three or four occasions in the earlier days of my residence in Minnesota. They went out without any trouble whatsoever. I am positive that, if a Norwegian here in Minnesota has become a leper after coming to this country, the authorities in Norway would be willing to take him back again to one of their national leproseries, if transportation could be arranged for.

MORBIDITY REPORTS

THEIR PURPOSE AND PRESENT STATUS [*]

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As knowledge has been acquired of the causes of disease, and it has become known that a large number of diseases are preventable, communities have established health departments. The health department as it is now understood is a comparatively modern institution. Its era may be said to have just begun.

THE PURPOSE OF MORBIDITY REPORTS

Whenever a community or state has progressed in its social life to the point where it has established an active health department it has required that physicians report the cases of certain diseases occurring among their patients. This has been recognized as a necessity, for the work of the health department is, if anything, the prevention of disease; and no health officer, no matter how efficient he may be, or how many able assistants he may have, can hope effectively to prevent or control a disease in a community unless he has some means of knowing when, where and under what conditions cases of the disease are occurring. Aside from any influence he may have in securing unpolluted water-supplies and better living and working conditions for the people generally, his field of action is practically limited to the notifiable diseases, and the extent and effectiveness of his work are determined by the completeness with which cases are reported by physicians. Unless cases are reported the health officer is in the position of one trying to combat an invisible enemy of whose location, numerical strength and times of attack he has no knowledge.

Morbidity reports had their origin in the requirement that cases of certain especially dangerous contagious diseases be notified to the proper authorities. This was for the purpose of making known the foci of these diseases so that the well could avoid unnecessary exposure, and, in some instances, so that the authorities could institute measures to prevent further dissemination of the infection. As knowledge of the means of spread of the communicable diseases has been acquired, the importance of knowing of the occurrence and location of cases has become more and more apparent. With increasing information of the preventability of many diseases and the possibility and need of their control, there is a proper tendency to require the notification by practicing physicians of cases of not only the more dangerous contagious maladies, but also of other infectious diseases, and of some diseases which are not known to be infectious, as cancer and pellagra. The last two named and others of their kind have been made notifiable because of the importance of knowing of their occurrence and varying prevalence, and the possible value of such knowledge in assisting in the finding of their causes and means of spread. In the case of at least one disease, ophthalmia neonatorum, notification has been required of nurses, midwives and parents for the purpose of making prompt and efficient treatment possible.

Recently a number of states have passed laws requiring the notification of certain industrial diseases, chief of which are the metallic poisonings. This is primarily for the purpose of showing where conditions exist capable of producing these affections so that measures may be taken looking to the remedying of the conditions and the prevention of similar injury to others.

The present purpose of morbidity reports is primarily fourfold and may be stated as follows:

1. To show the occurrence of cases of infectious diseases which constitute foci from which the infection may spread to others, as in scarlet fever, tuberculosis and small-pox.
2. To show the occurrence, distribution and varying prevalence of certain maladies of which the cause or means of spread is unknown, because of the possible value of this information in ascertaining the cause or means of spread, as in pellagra and cancer.
3. To make proper treatment possible, as in ophthalmia neonatorum.
4. To show the existence and location of conditions that are capable of causing illness or injury, as in the industrial diseases.

MORBIDITY REPORTS IN ENGLAND

In England beginning with the year 1911 the medical officer of the local government board has compiled reports of the notifiable diseases for all England and Wales. These diseases are small-pox, typhus fever, scarlet fever, diphtheria, typhoid fever, puerperal fever, erysipelas, plague, cholera, relapsing fever, pulmonary tuberculosis (added Jan. 1, 1912), cerebrospinal fever (added Sept. 1, 1912) and acute poliomyelitis (added Sept. 1, 1912). The local sanitary officers are required by a general order of the local government board, promulgated Dec. 13, 1910, to transmit to the medical officer of the board each Monday a statement of the cases notified to them during the preceding week. The medical officer of the local government board is the chief sanitary officer for England.

The experience leading to the present system for morbidity reports in England and Wales was similar to that through which the United States is now passing. Soon after the establishment of the registration of deaths in England, in 1837, it became evident that the record of deaths did not give the kind of information necessary for the control of disease and that sanitary officials must have other and additional knowledge of the occurrence of cases. Various men, societies and associations advocated at different times plans for the notification of sickness throughout the country. The British Medical Association, as far back as 1865, made repeated efforts to have adopted a uniform system for morbidity reports.

MORBIDITY REPORTS IN RUSSIA

In Russia sanitary regulations adopted in 1905 require that all physicians, whether engaged in private practice or in government service, shall forward to the local sanitary inspector having jurisdiction a monthly report of patients treated by them in private practice and in hospitals, the reports for the patients in private practice and those in hospitals to be made separately. In addition to this every case of infectious disease is to be reported at once. A heavy penalty is imposed for those failing so to report. Every hospital and clinic is also required to keep a detailed record of its patients and report regularly to the sanitary inspectors. The data received by the local sanitary officials in the monthly reports from hospitals and practitioners are compiled and forwarded annually to the chief sanitary inspector of the Ministry of the Interior on forms printed for the purpose. The chief sanitary inspector at St. Petersburg compiles these reports of the occurrence of sickness throughout the empire and publishes them annually.

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[*] Read in the Section on Preventive Medicine and Public Health of the American Medical Association, at the Sixty-Fourth Annual Session held at Minneapolis, June, 1913.

[*] Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

These sickness records for Russia include all parts of the empire. Among the infectious diseases for which statistics of the occurrence of cases are compiled are small-pox, scarlet fever, diphtheria, measles, whooping-cough, influenza, typhus fever, typhoid fever, dysentery, cholera nostras, Asiatic cholera, epidemic gastroenteritis, mumps, erysipelas, septicemia and pyemia, rheumatic fever, croupous pneumonia, tuberculosis, malaria, scabies, trachoma, syphilis, soft chancre and gonorrhea. Statistics are also compiled for mental diseases, traumatic affections and vaccination for small-pox.

MORBIDITY REPORTS IN THE UNITED STATES

In the United States the requiring of the notification of cases of sickness is a power residing in the respective state legislatures. In some of the states authority has been given to the state boards of health to cover the subject by regulations. In most instances local authorities have the right to supplement the state requirements by such additional ones as may be needed. The laws and regulations of the several states differ widely, as do also the efforts made to enforce them.

The common and most general plan is to require that the original report be made by the physician to the local health officer immediately on diagnosis of the case. The local health officer, either immediately or at intervals, forwards to the state health department a transcript or a summary of the notifications received by him. In a number of states these reports by the local health departments are made to the state authorities daily, in some weekly, in one state (Ohio) twice a month, in several states monthly, and in a few states at longer intervals. In the states in which the reports are made daily the state health department is in a position to keep constantly informed regarding the prevalence of the notifiable diseases. The same is in less measure true when the reports are made weekly. When the reports are made at longer intervals the current value of the information to the state department is largely lost.

In one state (Florida) physicians are required to report the notifiable diseases directly to the state health officer or his representative, the commoner diseases by mail, and yellow fever, small-pox and cholera by telegraph at state expense. This in effect makes the state health officer also the local health officer and responsible for the control of the notifiable diseases, the control of disease and the notification of cases being inseparable, the latter giving the necessary information by which to direct action in the former.

In the states giving special attention to the control of disease the territory has been so divided that all parts are within the jurisdiction of a local health department responsible for the notification and record of sickness and sanitary administration in matters strictly local in nature. In most instances the cities have their own health departments, and rural territory is under the jurisdiction of either county or township health officers.

So far as the results obtained are concerned the effectiveness of public health administration depends not so much on the nature and extent of the state laws and regulations as on the manner and degree of their enforcement. This is true of the requirements for morbidity reports as well as those relating to other subjects. State laws regarding the notification of disease and most other public health matters are impossible of proper enforcement unless the state health department has some control over local health officers. When the local health authorities are responsible only to their respective communities the state health department is practically without jurisdiction, and its usefulness is limited. In South Dakota this control over local authorities is obtained by making the county board of health consist of the state's attorney for the county and two physicians appointed by the state board of health; one of these physicians becomes the county superintendent of health. In Indiana the state board of health has the power to remove from office any county health commissioner or health officer in the state. In Virginia the state board of health appoints three physicians in each county and city who, with the chairman of the county supervisors or the mayor of the city, constitute the county or city board of health. In most states the local boards of health or health officers are either elected or appointed locally and the state has little if any direct control over their work. Still other plans have been adopted in other states.

THE NOTIFIABLE DISEASES

The following-named diseases are those specified by the various state requirements with the number of states in which each is notifiable:

Actinomycosis	2
Anthrax	7
Barber's itch	1
Beriberi	4
Cancer	1
Cerebrospinal *meningitis*	24
Chagres fever	1
Chicken-pox	16
Cholera (Asiatic)	38
Dengue	6
Diphtheria	40
Dysentery	1
Echinococcus disease	1
Epidemic dysentery	3
Amebic dysentery	2
Erysipelas	3
Favus	1
Follicular conjunctivitis	1
German measles	4
Glanders	8
Gonococcus infection	1
Leprosy	22
Malaria	5
Measles	25
Mumps	4
Ophthalmia neonatorum	12
Paragonimiasis (lung-fluke disease)	1
Paratyphoid fever	2
Pellagra	4
Plague	23
Pneumonia	6
Poliomyelitis	21
Puerperal fever	2
Rabies	7
Relapsing fever	3
Rocky Mountain spotted fever	2
Scarlet fever	39
Small-pox	44
Syphilis	2
Tetanus	5
Trachoma	8
Trichinosis	4
Tuberculosis:	
All forms	22
Communicable forms	1
Laryngeal	5
Pulmonary	9
Typhoid fever	27
Typhus fever	26
Uncinariasis	5
Whooping-cough	20
Yellow fever	30
Venereal diseases	2
Mental deficiency (including epilepsy)	1
Industrial diseases:	
Metallic poisonings due to	
Lead	8
Phosphorus	7
Arsenic	8
Mercury	7
Anthrax	6
Compressed-air illness	7

Forty-eight different diseases are specifically named as notifiable by law or regulation in one or more states. These are in addition to industrial diseases and mental deficiency. Fourteen diseases, cerebrospinal meningitis, cholera, diphtheria, leprosy, measles, plague, poliomyelitis, scarlet fever, small-pox, tuberculosis, typhoid fever, typhus fever, whooping-cough and yellow fever, are notifiable in twenty or more states. Small-pox is specifically made notifiable in forty-four states. This is a greater number than that for any other disease. Diphtheria is notifiable in forty states and scarlet fever in thirty-nine. Of the less commonly notifiable diseases cancer is notifiable in New York State and Chagres fever in Alabama. Venereal diseases are notifiable in California, Utah and Vermont. When reported, however, the name of the patient need not be given. In Porto Rico syphilis is among the notifiable diseases. Cases of mental deficiency, including epilepsy, are notifiable in New Jersey. Amebic dysentery and paratyphoid fever are notifiable in the state of Washington and the territory of Hawaii; barber's itch is notifiable in Oregon; favus, echinococcus disease and paragonimiasis are notifiable in Washington and follicular conjunctivitis in Hawaii.

Occupational Diseases.—Eight states have enacted laws requiring the notification by physicians of certain occupational diseases. These states are California, Connecticut, Illinois, Maryland, Michigan, New Jersey, New York and Wisconsin. The diseases specified in seven of the laws are compressed-air illness and poisoning by lead, phosphorus, arsenic or mercury or any of their compounds. Anthrax is named in six of the laws. The Illinois law, which differs to some extent from the others, requires that employers engaged in carrying on any process of manufacture or labor in which sugar of lead, white lead, lead chromate, litharge, red lead, arsenate of lead or Paris green are used, or in the manufacture of brass or the smelting of lead or zinc, shall once every calendar month have all the employees who come into direct contact with the poisonous agencies or injurious processes examined by a competent physician to ascertain if there exists any occupational disease. The physicians who make these examinations are to report their findings immediately to the state board of health. In six of the states the physicians report to the state board of health, in Connecticut to the commissioner of the Bureau of Labor Statistics and in New York to the commissioner of labor.

RESULTS ATTAINED IN CERTAIN STATES AND CITIES

The completeness of the reports of the notifiable diseases in states and cities in which there is registration of deaths may be estimated with some degree of accuracy by comparing the number of cases reported with the number of deaths registered as due to the same cause. In doing this, however, it must be borne in mind that we do not know the fatality-rate of many diseases, for up to the present there have seldom been satisfactory morbidity records of sufficiently broad application to permit of the determination of such rates, and also that the fatality-rates of many diseases vary from year to year and with the seasons and geographic locations.

Typhoid fever.—To show the results obtained in the notification of typhoid fever five states and three cities have been taken, all of which publish their morbidity records.

TABLE 1.—NUMBER OF CASES OF TYPHOID FEVER REPORTED FOR EACH DEATH REGISTERED*

States	1906	1907	1908	1909	1910	1911	Aver.
Colorado	7.2	7.6	7.9	7.3	7.3	...	7.46
Connecticut	4.4	5.0	6.2	5.8	6.6	...	5.6
Massachusetts	6.3	5.9	7.2	7.0	...	...	6.6
Michigan	4.1	3.0	3.6	3.9	4.9	...	4.9
New York	...	...	5.0	6.0	6.2	...	5.44
Cities							
Boston	8.1	9.0	10.0	7.3	8.1	7.9	8.4
New York	5.4	6.0	5.7	6.2	6.4	6.3	6.0
Washington, D. C.	6.9	8.1	7.5	6.8	8.8	...	7.62
Hospitals							
Boston City	...	...	...	7.6	7.0	9.3	7.96

*In this table and Tables 2, 3 and 4, the years ended Jan. 31, 1910, 1911 and 1912.

Among the states the highest average was 7.46 in Colorado and the lowest 4.9 in Michigan. Among the cities the highest average was 8.4 in Boston. This was higher than that for the city of Washington, although during the period under consideration typhoid fever was under special investigation there and the morbidity records were presumably reasonably complete. It will be noted that the average number of cases reported for each death was higher in the states of Colorado and Massachusetts as a whole than in the city of New York. The greatest number of cases per death reported for any one year in the states and cities enumerated was ten in Boston during 1908; the lowest was three in Michigan during 1907. It is of interest to compare with these averages that of the Boston City Hospital, in which during the three years 1909 to 1911 there was an annual average of one death in every 7.96 cases.

The averages for the same years were not taken in all instances, as the annual reports for recent years were not yet available for some of the states and cities.

Diphtheria.—Averages for diphtheria similar to those given for typhoid fever appear in Table 2.

TABLE 2.—NUMBER OF CASES OF DIPHTHERIA REPORTED FOR EACH DEATH REGISTERED

States	1906	1907	1908	1909	1910	1911	Aver.
Colorado	5.6	5.2	6.6	9.3	8.3	....	7.0
Connecticut	6.8	7.5	7.8	9.5	8.8	....	8.08
Massachusetts	11.2	11.9	12.0	10.8	....	....	11.47
Michigan	8.1	7.5	7.7	7.7	7.5	....	7.7
New York	....	....	8.6	8.9	9.3	....	8.9
Cities							
Boston	....	16.4	15.6	13.7	15.5	17.0	15.64
New York	....	8.8	9.3	8.9	9.9	10.5	9.48
Washington	....	14.7	21.9	12.3	15.3	....	16.05
Hospitals							
Boston City	....	....	....	11.7	15.3	12.8	13.27

It will be noted that the highest average number of cases reported in the three cities was 16.05 in Washington, and the highest average for the states 11.47 in Massachusetts; also that the Massachusetts state average is a trifle higher than that of New York City, and that the averages for both Boston and Washington are higher than that of the Boston City Hospital.

Scarlet Fever.—Similar averages for scarlet fever are given in Table 3.

TABLE 3.—NUMBER OF CASES OF SCARLET FEVER REPORTED FOR EACH DEATH REGISTERED

States	1906	1907	1908	1909	1910	1911	Aver.
Colorado	17.0	14.4	14.3	11.3	18.6	....	15.12
Connecticut	28.8	20.9	27.2	19.1	24.3	....	24.06
Massachusetts	38.7	27.8	20.6	25.2	....	....	28.07
Michigan	12.0	15.1	16.0	18.1	21.5	....	16.54
New York	....	....	18.2	18.4	19.5	....	18.7
Cities							
Boston	34.4	48.1	25.9	21.4	35.3	20.7	30.97
New York	....	19.8	18.3	15.8	19.8	21.3	19.0
Washington	28.9	84.0	32.7	34.8	91.0	....	54.28
Hospitals							
Boston City	....	....	....	19.6	22.7	18.6	20.3

In the states given, the highest average number of cases reported for each death was 28.07 in Massachusetts, and the lowest 15.12 in Colorado. In the cities the highest average was 54.28 in Washington. The Boston City Hospital average was 20.3 and was exceeded by that of the states of Connecticut and Massachusetts and the cities of Boston and Washington. The large annual average number of cases, 54.28, reported in the latter city for each death may possibly be due to a difference in the virulence of the disease.

Measles.—Similar figures for measles are given in Table 4.

TABLE 4.—NUMBER OF CASES OF MEASLES REPORTED FOR EACH DEATH REGISTERED

States	1906	1907	1908	1909	1910	1911	Aver.
Connecticut	29.3	30.5	34.4	55.1	43.7	....	38.6
Massachusetts...	74.8	39.8	44.2	58.6	....	....	54.35
Michigan	39.4	48.2	40.1	34.1	58.8	....	44.12
New York	....	....	50.9	40.6	54.4	....	48.63
Cities							
Boston	79.3	46.4	39.0	37.8	42.5	57.4	50.4
New York	....	22.8	39.4	34.0	45.1	38.8	36.02
Richmond	....	35.0	51.1	40.0	80.4	....	51.62
Washington	....	....	589.0	170.1	80.3	....	279.8
Hospitals							
Boston City	....	....	....	8.3	18.1	19.3	15.23

The highest state average for measles was that of Massachusetts, 54.35 cases; the highest city average was 279.8, that of Washington, where in 1908 there were 589 cases reported for each death. The lowest state average, 38.6, that of Connecticut, was higher than the lowest city average, 36.02, that of New York City, and over twice as high as the average in the Boston City Hospital. In the table for measles the City of Richmond, Va., was added because during the year 1910 special attention had been given by the health department to the notification and control of the disease. During that year, as will be noted, there were over eighty cases reported in the city for each death. As in scarlet fever in the city of Washington, whether the large number of cases reported for each death was due to a better reporting of cases or to a less accurate registration of the causes of death or to a diminished virulence of the disease is a matter of conjecture. The comparatively high fatality-rate of the Boston City Hospital is in accord with the common experience of hospitals, which undoubtedly accounts for the comparatively high fatality-rates usually cited in medical literature.

In this connection recent epidemics of measles in a number of cities are of interest. During epidemics the wide-spread prevalence of the disease is common knowledge, and it may properly be expected that at such times the notification of cases will be unusually complete.

The cases and deaths reported in these outbreaks are shown in Table 5.

TABLE 5.—CASES AND DEATHS REPORTED IN RECENT EPIDEMICS

	Cases	Deaths	Number of Cases for Each Death
Pittsburgh, Pa., 11/1/12 to 5/10/13 ..	9,003	147	61.2
St. Louis, 4/1/12 to 2/28/13	4,281	37	115.7
Richmond, Va., 1/21/13 to 4/26/13 ...	3,821	22	173.2

CONCLUSION

As the control of disease presupposes a knowledge of its occurrence, it is of importance that every local health officer know of the prevalence of disease not only in his own jurisdiction but in neighboring cities and counties as well. In the United States the state health department needs to know of the prevalence of disease throughout all parts of its territory, and also in neighboring states. For the purpose of the more extensive and more efficient public health work which is much desired there is needed a carefully worked out plan whereby all health authorities can be advised currently of the existence of epidemics and the prevalence of disease throughout the country. In addition to the information this would give of the approach of extending epidemic diseases, it would add immeasurably to our knowledge of epidemiology. Such a plan depends first on the conscientious reporting of cases by the physician to the local health authority, and secondly on prompt reporting by the local authorities to the state health department. The scheme, however, is not complete without the reporting by the state authorities to some common agent that will serve as a clearing-house for the state reports and publish the data at frequent intervals for the information of all. The latter is now being done in so far as it is possible. Practically all the states in which attempts are being made to secure exact knowledge of the current prevalence of disease by morbidity reports report to the Public Health Service the occurrence of disease in their respective states. For the immediate information of all the states provision has also been made for telegraphic reports at government expense of the occurrence of epidemics and of cases of diseases especially dangerous. This provision is for telegraphic reports by the state authorities to the Public Health Service of the occurrence of epidemic diseases in their respective jurisdictions. It also provides for the telegraphing by the Surgeon-General of the Public Health Service of the information thus received to the state authorities to whom the knowledge may be of value.

Pursuant to acts of Congress the reports of the occurrence and prevalence of disease received from state authorities and from other sources are published in the *Public Health Reports* of the Public Health Service, which are sent to state and local health authorities and to other sanitarians. These reports are issued weekly in editions of 8,000 copies and show among other things the current prevalence of disease throughout the United States, in so far as the information is available, and the prevalence of certain of the more dangerous epidemic diseases throughout the world.

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ABSTRACT OF DISCUSSION

Dr. Pauline M. Townsend-Hanson, Marshalltown, Iowa: I believe that Iowa in the last legislative session passed a law making venereal diseases reportable.

Dr. P. M. Hall, Minneapolis: Minnesota at the last legislative session made occupational diseases reportable.

Dr. James A. Hayne, Columbia, S. C.: The point in Dr. Trask's paper, outside of statistics, that interests me most, is that we need a clearing-house for our morbidity reports from the different states; that is, when a disease is epidemic in some of these states, or a focus of an epidemic has started in a state, health officers of other states should know something about it. This was brought to my mind the other day by the fact that I had a relative who wished to go out to Texas; when she went to buy a ticket, she found that Texarkana was quarantined on account of a cerebrospinal meningitis epidemic. I, a health officer, did not know that there was cerebrospinal meningitis in that place. Health officers should know these things, so as to be able to prevent the spread of disease from one state to another.

The Public Health Reports being printed weekly by the U. S. Public Health Service should show when such foci exist, but a great many states in the Union make no morbidity reports whatsoever. South Carolina does make morbidity reports. They are not accurate, but, still, they show when there is a focus of infectious disease in any county. We make these reports monthly to the U. S. Public Health Service by whom they are sent out, and the people of Georgia, or North Carolina, or in other neighboring states, are able to see that such diseases are present in our state.

For instance, we have had about two thousand cases of small-pox in the last two years; we have had probably about 1,100 cases of measles since Jan. 1, 1913. None of the so-called registration area states report anything like that number. We have also had cerebrospinal meningitis. We should have better reports of morbidity statistics made to a central office.

Dr. Liston H. Montgomery, Chicago: I can conceive of a case in which an adult contracts scarlet fever and the malady is so diagnosed by a reputable physician. For obvious reasons, he is dismissed from the case. Another equally reputable physician is called and fails to confirm the diagnosis. In the course of a few days, children in that family may become ill with scarlet fever and the second physician treats those children for scarlet fever. The question is, did the first person in that family, the adult person, have scarlet fever, or not? No other source of contagion was traced.

POSTOPERATIVE RENAL INFECTION *

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Postoperative renal infection may occur from an infection in some other part of the urinary tract, or be first in the uropoietic system. Already existing infections of the kidney pelvis may be the source of infection for infection of the renal parenchyma.

Independent of operation, renal infections occur during typhoid, attacks of tonsillitis, furunculosis, or from carbuncles and paronychiae. While any one of these causes may exist after operation and be the real etiologic factor of the renal infection, only such infections as occur as a direct result of the operation or its complications are here considered.

Baisch[1] states that in healthy women the urethra is seldom the seat of pathogenic bacteria, but that in those post partum, and after operation, the urethra becomes the habitat of infectious micro-organisms, and that the number present is in direct ratio to the length of time that the woman remains in bed. To this might be added that in the cases post partum and in operation attended with a discharge that bathes the urethra, the organisms are more plentiful. Such bacteria are then introduced into the bladder by catheterization, no matter what care is taken to cleanse the external genitals, and in a bladder already injured and not able to empty itself, cystitis is very apt to take place. This is especially frequent in patients operated on radically for carcinoma uteri.

A. Bauersein[2] found in eighteen autopsies following operation for carcinoma, cystitis in all, but no evidence of the infection extending through the bladder wall. He regarded the granulation tissue as a barrier to such extension, and found no bacteria beyond this. He considered the bladder infection as being due to introduction of infectious material through the urethra, or due to infection passing downward from the hematogenously infected kidney.

Sugimura[3] found in twenty-five cases of cystitis, involvement of the lower end of the ureter in all, and demonstrated that the infection in all extended along the lymphatics and not in the ureteral canal. Bauersein demonstrated that when the ureters had been extensively dissected they subsequently became embedded in a mass of indurated tissue. In these two ways a certain amount of stasis is produced, conducive to infection in whatever way it is introduced.

In extensive operations for carcinoma, in addition to the other causes above mentioned, the large amount of wound secretion flowing over the urethral orifice tends to urethral infection.

From the cystitis, infection may reach the kidney along the urethral channel, through the blood or the lymphatics. In proof of the first assertion, Stoeckel offers the history of a case in which from the lower end of the ureter urine containing pus was obtained, while from a point higher was drawn clear urine. In spite of this, many authorities doubt the ascent of infection from the bladder. In many of the experiments in which the urethra is ligated, and infection, first of the bladder, and then of the kidney, occurs, this infection may as well be explained on the hematogenous theory as that of ascension of the ureter, the organisms gaining a port of entry through the wound caused by the ligation. F. Pawlik[4] is a believer in hematogenous infection of the kidneys in cases of cystitis.

A. Bauersein proved in his necropsies on the patients dying after the Wertheim operation for carcimona, that occasionally the kidney and the perinephritic tissue became infected through the lymphatics coursing along the ureter.

In the same articles he states that he believes hematogenous infection, with the port of entry the operative wound, is more usual than is generally believed. Lichtenberg[5] thinks too much stress has been laid on ascending infection of the renal pelvis, and considers the hematogenous route the more frequent.

Franz Jaeger[6] reports two cases of acute infection of the renal paryenchyma in kidneys which were the seat of chronic pyelitis. One of these appeared to be an extension upward through the urinary tubules and the other a hematogenous infection, the lesions being multiple abscesses in the cortex. Dr. F. E. Sondern of New York has in his collection a very fine specimen of acute hematogenous infection of the cortex of a kidney, the seat of chronic pyelitis.

There are many instances of postoperative renal infection in which there has never been any catheterization of the bladder, antecedent cystitis, nor previous infection of the urinary system.

In a footnote on a lecture on colon bacillus infection of the kidney Harry Fenwick[7] speaks of the frequency of infection following operations for hemorrhoids. Here three causes are present: (1) Surface lesions in an infected area; (2) congestion of the vesical neck; (3) retention of urine. Piero Poleenigo[8] reports a case of metastatic multiple renal abscesses, following operation for hemorrhoids.

It has seemed to me that renal infections are more apt to occur when there has been some operation on the intestinal canal, or when there is a wound that is apt to be contaminated by intestinal contents. Baisch contends that the colon bacillus is seldom the primary factor, but that it subsequently is added and then supplants the other organisms. The fact that so many of these cases follow wounds especially apt to be contaminated by intestinal contents, rather speaks against this claim.

Possibly the constipation incident to postoperative intestinal peristalsis, and the purging used to overcome this may account for some of these cases.

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* Read in the Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

[1] Baisch: Ztschr. f. Geburtsh. u. Gynäk., 1904, viii.

[2] Bauersein, A.: Ztschr. f. gynäk. Urol., 1913, iv, No. 1.

[3] Sugimura: Virchows Arch. f. path. Anat., October, 1912.

[4] Pawlik, F.: Med. Klin., 1912, No. 43.

[5] Lichtenberg: Therap. Monatschr., June, 1912.

[6] Jaeger, Franz: Ztschr. f. Gynäk., cxi, Part 4, Ztschr. f. Gynäk., Urol., iii, No. 4, 1912.

[7] Fenwick, Harry: Clin. Jour., London, Feb. 2, 1910.

[8] Poleenigo, P.: Folia urolog., 1911, vi, No. 5.

It has been demonstrated that the kidneys can excrete bacteria without being harmed, and it is necessary that the bacteria lodge and develop to produce pathologic lesions. The extent of the damage depends on the point of lodgment, the number and virulence.

The fact that many of these infections do not occur right after operation, but days later, make me think the infection is started from the breaking loose of thrombi from the vessels of the wound region. Points in favor of this are that usually after operation there is something indicating infection and that the acute condition is sudden.

The symptoms of infection of the kidney after operation depend on whether the pelvis is involved from an extension up the ureter, or the parenchyma is involved primarily through the blood. In the first instance there is apt to be a history of cystitis which on involvement of the pelvis of the kidney is attended with pain in the lumbar region and along the ureter, with a rise of temperature, with or without chill. Unless there is some retention in the pelvis, pain is absent, and there is little aside from moderate temperature to call attention to such an extension.

SYMPTOMS

In the acute hematogenous infections, which usually affect only one kidney, during convalescence, without any warning there is a sudden rise of temperature, sometimes preceded by chilly sensations or by a distinct chill. The temperature is generally marked by decided remissions. Pain may or may not be present in the affected kidney. Other constitutional symptoms are dependent on the severity and the character of the infecting organism. While the colon bacilli infections are attended with chills and high temperature, the constitutional disturbances are not so marked as in other infections. Often there is delirium and other evidences of disturbance of the sensorium. At first there is apt to be lessened frequency of urination due to decreased fluid output by the kidneys. Later when the ureter and bladder become involved there is frequency.

DIAGNOSIS

Early in the disease there is little in the urine to help in the diagnosis. At first it is usually high-colored, as in any other marked febrile condition. Bacteria may be isolated by culture. At the beginning there is not apt to be pus in the urine, and according to Münnich[9] this is especially so in the instances of colon bacillus infection. Later, pus casts, and at times blood, are to be seen in a urine that is highly albuminous. After involvement of the pelvis, pus is found in greater quantities.

SUMMARY

There are the three types of postoperative renal infection—through the blood, lymph-channels, and up the ureter. I think the ascending infection through the blood is the most common, and that the latter is much more frequent than is generally supposed.

The late occurrence of the infection, and the fact that most of the patients have had some rise in temperature immediately following operation, lend weight to the theory that the origin of the infection is from thrombi at the seat of operation.

Renal infections are probably more frequent than is imagined and will be detected oftener when the surgeon bears this in mind.

Below I have briefly given the histories of several cases. The hair-pin case does not properly fall within the scope of this paper, but it is inserted, as I believe the renal infection was hematogenous, the point of entrance of the bacteria being through a wound caused by the pin.

CASE REPORTS

Case 1.—Mrs. R., a patient whom I saw in consultation with Dr. Perry S. Boynton, to whom I am indebted for the notes and the privilege of reporting the case, had one child eighteen months before her operation, April 5, 1912. The examination of the voided urine before operation showed a few red blood-cells and a few pus cells. The operation was a curettage, trachelorrhaphy, perineorrhaphy, appendectomy for chronic appendicitis, and freeing of adhesions of the left tube and sigmoid. Symptoms were promptly relieved and the patient made a good recovery and left the hospital April 20.

While waiting for a car on an exposed corner the patient became chilled. Two days later she had a distinct chill, followed by fever and a dull aching pain in the left lumbar region. The next day Dr. Boynton saw her and found a large tender left kidney; at this time the temperature was 103 and pulse 120. Two days after this the right side was similarly affected. There was pus and colon bacilli in the urine. Dr. Boynton made a diagnosis of bilateral pyelitis. She was given intestinal and urinary antiseptics, and colonic irrigations. The condition persisted with exacerbations and remissions for six weeks.

June 8 she returned to the hospital and on June 12 and 14 I catheterized both ureters, obtaining from them urine with a moderate amount of pus and colon bacilli. Each time I irrigated the pelvis with 1:500 silver nitrate solution. In the next ten days the symptoms gradually improved, and she was able to leave the hospital June 26. After that she gained rapidly in strength and weight and became pregnant for the second time in October. She manifested no further urinary symptoms, and at the eighth month the voided specimen showed only an occasional pus cell.

Remarks: There were a few pus cells in the urine before operation, but as this was a voided specimen there is no certainty that they came from the urinary tract. The patient was catheterized twice after operation. It is possible that the chilling experience on the trip home may alone have accounted for the kidney infection, or may have produced a certain amount of renal congestion that would favor other factors. The apparent beneficial effect of the pelvic lavage is to be noted.

Case 2.—Mrs. A. L., aged 33, was seen first in February, 1910. Menses began at 14, occurring regularly every four weeks; moderate in amount, with severe pains in the lower abdomen on the second, third and fourth days. Soon after marriage she became pregnant and had to be aborted on account of pernicious vomiting at the third month; this was nine years ago. The menses after this were scanty. Within a few months after the abortion she had appendix and both tubes and ovaries removed. She is not certain of the conditions that necessitated such an operation.

A week or ten days after the operation patient had a chill, rise of temperature, and pain in the abdominal wound, which broke down. Three weeks after operation the patient took a full bath; following this she had severe pain in the right kidney region for a week. At first there was some blood in the urine, and marked frequency of urination. The patient thinks she had a rise in temperature for a few days at this time. After this she did not feel well, and about every four to eight weeks she had attacks of pain in the right lumbar region, sometimes associated with vomiting and sometimes with temperature. Had frequent urination and moderate pyuria after the primary attack. I saw her first three years ago, when a diagnosis of colon bacillus of the right renal pelvis was made. As this did not clear up promptly under the administration of hexamethylenamin, I catheterized the right ureter and instilled into the pelvis half an ounce of 1 per cent. nitrate of silver solution. Since then she has never had any pain in the kidney region and the pyuria and the frequency of urination have disappeared. The patient has since been in better health than at any time after the operation.

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[9] Münnich: Arch. f. klin. Chirurg., xcviii.

Case 3.—Mrs. A. G., aged 27, seen through the courtesy of Dr. Edward Pinkham, was admitted to the hospital Dec. 8, 1908. She had had two children and two miscarriages, all uneventful. Her menstrual history had been normal until the month before entering the hospital, and in this time she had flowed, off and on, for two or three days at a time, profusely. For the week just before entering she had no flow.

December 9 she was curetted and the uterus swabbed with tincture of iodin and phenol (carbolic acid). She was catheterized three times in the thirty-six hours after operation.

December 17 she complained of some bladder discomfort, and the next day of some pain in the back. On December 20 she was still complaining of pain in the back, and there was a sudden rise of temperature in the early morning to 101.8 F., which increased to 104 in the afternoon. At this time the pain in the back seemed to be more acute on the left.

December 21 I employed the cystoscope and found a slight cystitis. Both ureters were catheterized and from both was obtained highly colored, turbid urine, containing pus and pus cells, more from the left. The same results were obtained on December 22.

As the patient was not improving, on December 24 Dr. Pinkham cut down on the left kidney, which was large, congested and was dotted with many small infarcts. An incision was made through the cortex into the pelvis.

Blood-counts on December 26 showed 14,000 leukocytes, 80 per cent. polynuclears, 15 per cent. small lymphocytes, 5 per cent. large. On December 28 the count was 11,000 leukocytes, 70 per cent. polynuclears, 19 per cent. small, and 5 per cent. large lymphocytes.

Following the operation the patient did not improve, and ran a high temperature, which gradually fell to normal Feb. 3, 1909, and there remained.

Until January 21 there was marked albuminuria, with hyalin, finely granular, at times pus, casts and much pus in the urine. Even at the time of her discharge, January 30, there was a marked amount of pus in the urine.

She returned to the clinic after six weeks, when we found that she had pus coming from both kidneys. This was cleared up after a few nitrate of silver injections of the renal pelvis.

I have to thank Dr. Burton Harris for the report of the next two cases. They were included in his paper on renal infections which he read at the Boston meeting of the Urological Society.

Case 4.—Mrs. M. W., aged 24, housewife, was seen in consultation with Dr. Charles Wuest and Dr. Rudolph Herriman Feb. 1, 1912. The records show that there had been an instrumental delivery of a normal child on Dec. 1, 1911. There had been no vesical or renal symptoms during pregnancy and the urine had shown no pus. A perineal tear had been immediately repaired. Catheterization was necessary for three weeks thereafter. One week after delivery she began to suffer from "chills and fever." The record states that there was no abdominal tenderness and that the heart and lungs were found normal. She had been under the observation of several physicians, who agreed on a diagnosis of post-partum septic endocarditis. The urine had shown a large amount of pus. Hexamethylenamin, 5 grains, was given every four hours from December 28 until January 17. Blood cultures were negative.

From December 28 until February 1 the temperature had ranged between 103 F. and 105 F., with marked morning remissions, and the pulse from 130 to 140, rather closely following the temperature curve. On February 1 the patient was septic in appearance and the mouth dry and foul; the temperature was 103 F. and the pulse 130 and of poor quality. We found no physical signs on which to base even a possible diagnosis of endocarditis. Examination of the abdomen was negative. There was moderate tenderness in both costovertebral angles. The bladder urine was acid in reaction and loaded with pus and bacteria. The blood-count showed 18,000 leukocytes, with 18 per cent. of polymorphonuclear cells. The blood cultures were negative.

Cystoscopy showed an intense general cystitis. No. 6 F. olive-tipped catheters passed easily to both renal pelves. The urine from the right side was acid, very turbid, contained a large amount of albumin and showed many epithelia from the convoluted tubules and renal pelves. Pus corpuscles and bacteria were present in abundance. Culture showed colon bacilli and *Staphylococcus aureus*. Their presence could not be ascribed to accidental contamination, for large clumps of cocci and bacilli were present in the fresh sediment of the urine obtained by the ureteral catheter. The urine from the left side was acid, somewhat less turbid but contained the same microscopic elements as that from the right. The colon bacillus was found in pure culture. On completion of the examination 10 c.c. of 10 per cent. argyrol was injected into both renal pelves and the patient kept in the Trendelenburg position for fifteen minutes. This was repeated on February 5, a 2 per cent. solution of argyrol being used. One-half c.c. of Van Cott's mixed vaccine was given on February 3, 7, 10 and 14. Her convalescence was uneventful. On March 1 the pus and bacteria had entirely disappeared from the urine, but the specimen continued to show albumin and occasional hyaline and granular casts and numerous epithelia from the convoluted tubules. At the time of her discharge on March 17 she was clinically cured and the urine showed no abnormalities.

Remarks: We have in this case a patient who had suffered from renal suppuration, mistakenly diagnosed as septic endocarditis. For more than a month the temperature had ranged from 103 F. to 105 F. I am of the opinion that a study of the chart shown in Figure 4 will convince the most skeptical that either the renal instillations, the vaccines, or probably both, had a beneficial influence.

Case 5.—Mrs. M. N., aged 22, housewife, was seen in consultation with Dr. Armin Sibbel on Jan. 1, 1912. Ten years previously she had suffered from acute articular rheumatism and endocarditis. There had been a mitral systolic murmur and hypertrophy of the left ventricle since that time. The records showed that on Dec. 6, 1911, there had been an instrumental delivery of a normal child. The perineum had been torn into the rectum, but was immediately repaired and healed *per primam*. Repeated urinalyses made until the delivery had shown no abnormality, with the exception of a faint trace of albumin. Following delivery the urine showed a few pus corpuscles and red blood-cells for several days, but this rapidly cleared up and was attributed to trauma. The temperature, which had been absolutely normal, began to show an evening rise to 99.5 F. The pulse, which had been running between 80 and 90 before delivery, suddenly shot to 130 and ran from 100 to 120 until December 14, the evening pulse-rate being about 20 above the morning. When discharged from the hospital December 23 the temperature was 99.2 F., the pulse 100, repirations 20. She looked and felt perfectly well and the urine showed no abnormality.

On the evening of December 29 she was suddenly seized with a severe chill and lancinating pain in the region of the right kidney. Vomiting and dypsnea were marked features. Dr. Sibbel was called in the morning of December 30 and found the patient suffering from orthopnea and moderate cyanosis. There was marked edema of both legs. The temperature was 102.2 F., pulse 140 and irregular. She complained of a dull pain in the right kidney, the lower pole of which could be felt, and was very tender both anteriorly and in the costovertebral angle. Digalen and hexamethylenamin (urotropin) were given.

At 4 p. m. January 1 the cardiac conditions had improved, the pulse having dropped to 110 and being of fair quality, but the temperature was 103.5 F. The patient complained of a dull pain in the region of the right kidney, and there was moderate tenderness in the costovertebral angle. The urine was acid, turbid, and analysis showed a large amount of albumin. There were many epithelia from the convoluted tubules of the kidney and a few blood-casts. Pus corpuscles and red blood corpuscles were present in moderate numbers. Stained smears of the sediment showed bacilli in abundance, which on culture were found to be colon bacilli. Blood culture by Dr. Holzman was negative. The leukocyte count was 12,000, with 88 per cent. polymorphonuclear cells.

Cystoscopy showed no abnormality in the bladder. No. 6 F. catheters passed freely to both renal pelves. The urine from the left side was clear and showed no abnormality. That from the right was turbid and showed the same chemical and cellular features as that from the bladder. The colon bacillus was found in pure culture. Phenolsulphonepthalein appeared on the left side six minutes after hypodermic injection; urea 0.021 per c.c. On the right side the dye appeared in nineteen minutes; urea 0.006 per c.c. Ten c.c. of 20 per cent. solution of argyrol was instilled into both renal pelves and the patient kept in the Trendelenburg position for fifteen minutes. A mixed vaccine 0.5 c.c. was given. On the following afternoon her condition was decidedly better, the temperature being 101; pulse 110. Both pain and tenderness were less marked. The vaccine was repeated January 3. January 6 the temperature was normal and the pulse 106. The edema of the legs had entirely disappeared. Renal pain and tenderness had quite subsided. The urine was clear but showed more than a trace of albumin, a few hyaline casts, many epithelia from the convoluted tubules of the kidney and a few pus and blood-cells. Weekly analyses of the urine showed traces of albumin with renal epithelia and an occasional cast for two months after the attack.

Dr. Sibbel reports that with the exception of occasional attacks of cardiac pain with the evidence of temporary failure of compensation, she enjoyed good health.

I was unable to make a further study of the functional capacity of the right kidney, as the patient refused instrumentation.

Case 6.—The patient, A. D., was first seen on account of chronic urethritis in 1909, when she was 19 years old. She confessed masturbation. The appendix was removed because of constant pain and tenderness over McBurney's point, but with no relief. She was radiographed for renal and ureteral calculi but none were discovered. The pelvis of the kidney was distended with fluid after the method of Kelly and the pain of which she complained was reproduced and exaggerated.

In 1910 her right kidney was explored. It was found to be 4½ inches long, with almost complete atrophy of the cortex of the upper three-quarters. It was removed and she was relieved of the symptoms.

In 1911 she went to the City Hospital for chronic urethritis, and while there had several operations on nose and throat, and a laporotomy for tubal disease. Shortly after this I heard of her as a patient with marked polyuria, the amount being 200 ounces a day.

In August, 1911, I took her in the Post-Graduate Hospital, as she had had retention for five weeks. Catheterization six to eight times daily was necessary, and 20 to 30 ounces were obtained each time. On one occasion she attempted to catheterize herself with a pencil from which the lead had been removed, explaining the act on the ground that she was in discomfort from over distention and could not wait for the nurse. The urine was of low specific gravity, no albumin and the phenolsulphonepthalein elimination was normal. Through suggestion she was relieved.

On Jan. 15, 1912, I saw her again. She told me that two weeks previously she had allowed a girl friend, who wanted to be a nurse, to catheterize her, and that to stiffen a soft rubber catheter she had placed in it a hair-pin. The next day the friend confessed that the hair-pin had escaped into the bladder. This was evidently untrue, as the irregularly bent pin which I found with the cystoscope could not have been inserted in the catheter. This pin was finely coated with a white deposit of salts, and the bladder only slightly hyperemic. She did not allow me to remove it.

On Feb. 3, 1912, she called me and reported that the day before she had two chills, fever and pain over the right kidney. The urine contained a large amount of pus, hyaline and granular casts. On February 4, through a Kelly endoscope, I removed the pin. By February 8 the temperature fell to normal, and in a week the patient was discharged. This is not strictly a postoperative renal infection, but is reported as I believe that the pin caused wounds of the bladder mucosa, through which infectious organisms entered the circulation and caused the kidney infection.

On March 1, 1912, she inserted another pin in the bladder which now, May, 1913, shows only slight incrustation—the bladder is only moderately hyperemic. In March, 1913, she broke a needle in her hand.

For the histories of the next two cases I am indebted to Dr. George Gray Ward, through whose courtesy I am able to report them.

Case 7.—Mrs. G. P. was operated on Aug. 26, 1908, for complete perineal tear and lacerated cervix; sustained in labor six weeks previously. The uterus was punctured accidentally with the curet and had to be repaired through an anterior colpotomy wound.

For the fifteen days following operation she ran a temperature from 99 in the mornings to 101 F. in the afternoons.

For the first nine days after operation it was necessary to catheterize the patient.

September 23, after nine days of normal temperature, with no apparent cause, the temperature was 100 F., and the same the next day. On the morning of September 25 it was 98.6 F., but rose by 4:20 in the afternoon to 103.4 F. September 26 it ran from 103.8 to 106 F., the low points being obtained with alcohol sponges. She began menstruating the next day, and then the temperature began to fall by steps and in four days reached normal, where it remained until October 8, the day preceding her next menstrual period, when it rose to 102.2 F. In two days it was normal and so remained.

She had no pain in the region of the kidneys. There were pus and pus casts in the urine and the colon bacillus was isolated by culture.

Treatment consisted in combating symptoms, and giving large amounts of water and hexamethylenamin. The patient made a good recovery and has since remained well.

Remarks: The patient was catheterized for nine days and had a rise in temperature for seventeen days after operation, indicating an infection. The late development of the renal condition and the possible association of the menstruation, as shown by two rises of temperature just before menstruation started, are to be noticed.

Case 8.—Miss J. N., patient of Dr. George Gray Ward, Jr., was operated on, curettage, Gilliam shortening of round ligaments and appendectomy having been performed. She gave a history of two attacks of appendicitis. Catheterized twice after operation. August 31 she complained of painful urination, and on September 2 the bladder was irrigated.

September 3 the temperature rose to 100.6 F. and the next day to 102.8. From the fifth to the ninth it ranged from 99 or 100 in the mornings to 101 F. in the afternoons. On the tenth, coincident with menstruation, there was an accession to 103.8, and 104 the following day. The day afterward the temperature was 101, and in the succeeding days dropped to 99.5. There was an exacerbation on the twentieth to 101.6, and on the twenty-first to 103.6. From then the patient rapidly improved, the temperature came down to 99.5, and so persisted until the time of her discharge on October 1. There was much pus in the urine. At no time was there any pain in the region of the kidneys.

Dr. Ward believes that the renal infection in both these cases was an ascending one.

I am indebted to my brother, Dr. J. N. Furniss of Selma, Ala., for the next case.

Case 9.—Mrs. T. B. M., resident of Tennessee, was admitted Feb. 20, 1913, suffering with an acute attack of chronic left salpingitis. First attack dates back four years following the birth of a child, at which time she was ill for several weeks with a pelvic inflammation.

Palliative treatment was employed until March 5, when the left tube, which was full of pus, and the appendix, which was bound down by adhesions, with a concretion about the middle, were removed. The patient was catheterized for the first three days after operation. Five days after the operation the patient began to have painful and frequent micturition, with thick, ropy mucus in the urine. This condition cleared up in a few days under bladder irrigations and urethral applications of 20 per cent. argyrol. The general surgical convalescence was excellent, the wound having healed by first intention. March 26 there was rigor and temperature ran to 103 F., with intense pain in the right loin, radiating to the right iliac region. The urine contained pus, blood and bacteria and was acid in reaction. The temperature ran from 103 to 100 F. until April 6. Pain and tenderness were incessant during this time. From April 6 to 10 the temperature gradually returned to normal and the patient left the hospital April 28 with negative urine and relief of symptoms. The treatment used was stock colon bacillus vaccine and large doses of hexamethylenamin, 10 grains each four hours.

The report from this patient June 8 was that she was well and still gaining in weight at the rate of 2½ pounds a week since leaving the hospital on April 28.

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ABSTRACT OF DISCUSSION

Dr. J. W. Draper, New York: About eighteen months ago Dr. Braasch and I cut a number of ureterovesical valves in the dog. The reason for doing so was to find out if it were safe to cut this valve in the human being. We had heard so much about the value of this so-called "valve" in preventing ascending infection and bladder reflux that Braasch and others hesitated to cut it. The experiment, briefly, was as follows: After opening the bladder in the dog, it was a simple matter to raise it so that either one or both valves could be cut with a delicate pair of scissors. A cubical piece of anthracite coal was rubbed in the dog's feces and introduced into the bladder, which was then closed. These animals recovered with reaction and lived without any apparent discomfort. They easily held their own with the rest of the pack. They passed what may rightly be called pus in the urine. It answered the clinical description of pus, in that it contained living organisms and immense quantities of leukocytes. The organisms did not penetrate deep into the bladder wall and the animals may, therefore, be said not to have had a true cystitis. We were never able to show that there was any infection whatsoever of the kidneys in these animals, and many of them lived for a number of months. Moreover, hydronephrosis did not occur; the real factor in reflux prevention being the physiologic activity of the ureters rather than the mechanical action of the valve. Since returning to New York I have repeated these experiments and have again been unable to find, either grossly or microscopically, that in this type of experiment on healthy dogs any such thing as ascending infection occurs. Our experimental findings are therefore in exact accord with the clinical studies of Dr. Furniss. The post-mortem studies have been carefully made. The results were reported before the section on genito-urinary diseases in Atlantic City in 1912. These studies led us to consider that it is safe to cut the valves in human beings, that ascending infection under these conditions did not occur and that stones lodged in the caudad extremity of the ureter could safely be removed by valve section and without laparotomy. Bleeding may occur, as in a case verbally reported by Dr. Furniss, but it should not be severe. Infecting the bladder in dogs, then, with one or both ureterovesical valves destroyed, will not cause renal infection or degeneration. It should be impressed on us all, nevertheless, that we must be careful in drawing conclusions from the case of the healthy dog and applying them to the sick human being.

Nature Refuses to be Pigeonholed.—Referring to a case of clonic spasms in a man which it was impossible to classify, Dr. Savill says: "It is one more illustration of the fact that Nature—whether in health or disease, it matters not—refuses to be pigeonholed."—Thomas D. Savill, in (London) *Clinical Journal.*

TWO AND ONE-HALF YEARS' EXPERIENCE WITH SALVARSAN AND NEOSALVARSAN

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From laboratory experiments on animals infected with the syphilitic organism it was at first thought that a sufficient amount of the synthetic arsenic compound known as salvarsan might be administered at one time to cause a complete sterilization or destruction of the spirochetes in man; hence the name under which it was possibly not most ethically heralded to the world—*therapia sterilisans magna.*

Contrary to what was first supposed, however, we now know that one dose is not expected to cure a case of lues even in its primary stage. But the value of these compounds, which have been used so extensively during the past two or three years, has been sufficiently proved to warrant the assertion that Ehrlich has made the greatest advance in the therapy of syphilis since it was first noted, several hundreds of years ago, that luetics improved under treatment with mercury.

From clinical experience it has long been known that preparations of iodin, especially the potassium iodid, while useful in causing certain late lesions of syphilis to disappear, have little or no appreciable effect in causing the elimination of the disease itself; in other words, possess no curative properties. Salvarsan, on the contrary, while capable of causing all of the symptoms of syphilis to disappear, has also a marked curative effect. This has been repeatedly demonstrated in my own service and by others in observing the effect of the drug when administered internally on the spirochetes of the initial lesion. While salvarsan has a marked curative effect, yet better and quicker results are obtained when mercury is also given than when either drug is given alone, a point that has been especially emphasized by Neisser and others.[1]

As might be expected with any new and unknown remedy so widely used and of such a powerful nature, fatal and unpleasant effects have been noted. In this second series,[2] up to the time of writing 220 cases have been treated with salvarsan and neosalvarsan. The first ten cases were treated with salvarsan injected intramuscularly. Since then, up to about the middle of 1912, most of them were treated intravenously with the alkaline solution. Since then neosalvarsan has been used exclusively, as the solution is prepared more readily and the immediate after-effects have been nil, except as noted later. This drug has also been used quite a few times intramuscularly, but this method is sometimes painful and may leave large, tender, indurated masses in the buttocks of one or more weeks' duration, which renders it less suitable than the intravenous route. In fat persons and in small children, however, it is the procedure of choice. A small 3-year-old child was treated in my service, for an innocently contracted lues, by intramuscular injections of 0.15 gm. neosalvarsan with excellent results, the child complaining of no pain.

The solutions of neosalvarsan for intravenous injections have been prepared, for the most part, with freshly distilled, sterilized water, although in a certain number a 0.4 per cent. saline has been used. In a few instances it was thought the water in passing through lead pipes after being distilled became contaminated and a Barnstead still was therefore installed in my laboratory. No ill results have been noted when water from this still was used. I think great care should be taken in every stage of salvarsan administration and that no one should attempt it without being thoroughly drilled and having suitable facilities at his command.

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[1] Neisser, A.: Moderne Syphilistherapie mit besonderer Berücksichtigung des Salvarsans, Carl Marbold, Halle, 1912.

[2] Corlett, W. T.: Cleveland Med. Jour., December, 1910.

In the light of Milian's[3] recent report of a case of hemoglobinuria in a patient in whose treatment distilled water was used and in experiments on animals, it might be better to use the isotonic solution of neosalvarsan in a 0.4 per cent. saline water, although my own experience does not warrant this conclusion.

Most of the 220 patients treated have had three or four or even more injections. It has been a general rule with patients of average weight to give a first injection of 0.6 gm. neosalvarsan or 0.4 gm. of old salvarsan in men and 0.5 or 0.3 gm. in women, and if well taken to repeat in one week with a 0.75 gm. in women and 0.9 gm. (0.5 gm. and 0.6 gm. old salvarsan) in men, and once a week thereafter for at least two or three injections; after which there is usually a suspension of the arsenic therapy for several weeks or months. During this time advantage is taken of a course of mercurial treatment. I should like to emphasize the fact that in no case is the intramuscular administration of mercury, preferably in the form of gray oil, forgotten. Thus used in conjunction with mercury the results have been most excellent, not only in alleviating the patient's symptoms but also in regard to his general health as well as in the effect on the Wassermann reaction. The arsenic therapy seems to be of special value in primary and early secondary lesions. One injection of salvarsan will usually cause a practical disappearance of a primary lesion or of a secondary eruption. In some cases with old tuberculous lesions it works satisfactorily, then again shows little effect. In several cases of tabes and in one in particular, the results have been striking, so that the patient who formerly could hardly walk, has now thrown away his canes and gets around very comfortably. What the final results will be in some of these cases it is of course too soon to say.

With the first cases treated with the old drug there were frequently marked symptoms of gastric disturbance, chills, fever, headache, etc., but as time progressed the toxic qualities of the drug seemed to lessen so that during the first months of 1912 my patients showed few unpleasant symptoms from salvarsan. With the neosalvarsan the same absence of unpleasant sequelae has been observed. We are now giving dispensary patients intravenous injections, allowing them to rest for a time and then go home in a conveyance, if possible, and directing them to keep quiet until the next day or longer if necessary. We believe that this heroic combined treatment of clinical patients renders them innocuous to the community at the earliest possible moment. It has not been my good fortune, however, to maintain this favorable report in all cases, and I shall now take up these unfavorable experiences in detail.

REPORT OF CASES

Case 1.—*History.*—The patient, C. Y. R., a merchant, aged 57, weight 165 pounds, stated that six weeks previously a barber had cut his upper lip with a razor and that some time afterward a sore developed on the spot and gradually increased in size. He had some headache and general malaise, but otherwise felt well. He was admitted to the hospital May 6, 1911. At the time of entrance there was a marked swelling and induration of the upper lip on the right side, while on the inner border there was a red ulcerated area. The cervical and submaxillary lymph-nodes were very much enlarged and quite painful to the touch. Naturally, lues was thought of, but inasmuch as the family physician had used calomel ointment locally it was impossible to find the *Spirochaeta pallida*, and a diagnosis of syphilis was not made until the appearance of the secondary eruption some days later. The patient was given an intravenous injection of salvarsan, 0.6 gm., May 15, 1911, which was followed by marked flushing of the face and an uncomfortable "bursting" feeling in the head for several hours. He returned home, however, eight days later, much improved and gradually resumed his business. About the middle of June, or three weeks later, the patient noticed that he was unable to move the right side of the face, including the eyelid, which drooped, and the lips, without some effort and pain. Otherwise he felt well and the primary lesion had entirely healed. The trouble was believed to be a Herxheimer reaction and the patient was directed to begin inunctions of mercurial ointment; the symptoms cleared up within a week. He was then advised to take a vacation and proceeded to a fishing camp in Canada. While there, about July 24, he began to have intense frontal headaches and pain in the back of his eyes, with at times almost complete loss of sight. With these symptoms hallucinations developed. He once more entered the hospital.

Examination.—At the time of entrance, Aug. 8, 1911, his general physical condition was good, but his sight poor, and an examination made at that time by Dr. B. L. Millikin was as follows: "Sight right eye, 6/24; left eye, 6/24-1. Both eyes tested with circles 1.5 cm. in diameter for white, red and green give a fairly good field in all directions and with proper relations to one another. The objects grow brighter as the fixation point is approached for colors and white, showing no scotomas. Ophthalmoscopic examination shows the media all clear, pupils rather small and reacting promptly to light and accommodation. The disk is round, good sized, broad central physiologic cup. There is a slight pigment ring. The arteries and veins are both good sized and normal in distribution and not tortuous. The temporal half of both eyes shows somewhat pale, but no marked striations."

Treatment and Course.—The patient was not given salvarsan because of the hardened condition of the arteries and the marked reaction he had shown, but was immediately put on daily injections of mercury biniodid ¼ grain and later mercury chlorid from ⅛ to 1/6 grain. He was discharged September 20 much improved and since then has had mercury salicylate injections at regular intervals and is doing well.

Diagnosis.—"Herxheimer reaction followed by neurorecurrence," following chancre treated with salvarsan. Recovery.

Case 2.—*History.*—The patient, J. H. D., was an illustrator, aged 29, weight 137 pounds. The personal history is negative aside from a luetic infection of seven years' duration, for which the patient had taken large amounts of mercury by the mouth, but for two or three years this treatment had not reacted well. He was troubled with ulcerations of the throat which were very obstinate in healing.

Treatment and Course.—Being consulted by his family physician I advised the use of neosalvarsan. The patient received an injection of No. 4 (0.6 gm.) neosalvarsan intravenously, Nov. 17, 1912. He reacted well and went back to work the next day. Seven days later the patient received a trifle less than No. 6 (0.8 gm.) neosalvarsan intravenously. Shortly afterward he was taken with paroxysms of vomiting which continued all night and the next morning. Through some error the patient was allowed to go home although still vomiting and having a temperature of 101.5 F. During the next two days the vomiting continued and the patient had severe chills and fever with twitchings of the muscles. I was notified of his condition on the third day after his injection when he had a temperature of 102.5 F. He was perspiring copiously and was in an almost continuous chill with marked chattering of the teeth. As it looked like an infection the patient was removed to the hospital at once where a blood-culture was made and found to be sterile. At that time a blood-count showed 8,000 leukocytes. The next day the patient was somewhat improved and was able to take some liquid nourishment, but his body was covered with a general erythematous eruption and an extensive herpes had appeared on the right cheek. On the sixth day he complained that his left leg was helpless and that his body was numb below the waist-line.

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[3] Milian: Bull. Soc. franc. de dermat. et de syph., December, 1912.

First Examination.—Nov. 30, 1912: Heretofore the patient had been restless and vomited so much that a careful physical examination was impossible until to-day, thirteen days after arsenical treatment. The skin is of a reddish, somewhat erythematous hue. No jaundice, anemia, edema or cyanosis is observed. There is a herpetic eruption on the right cheek, as previously noted. The conjunctivae are somewhat injected, but the movements of the eyeballs are normal in all directions. There is no ptosis, strabismus nor nystagmus. The palpebral fissures are equal on the two sides. The pupils are irregular and the reaction to light and accommodation is sluggish. The tongue is coated and tremulous, but protrudes in the median line. The right posterior pillar of the fauces is bound down by old cicatricial adhesions. The heart and lungs show nothing abnormal, nor does the abdomen reveal any enlargement of the liver or spleen. The patient is unable to move the thighs, legs, feet or toes, although as yet there is no atrophy of the muscles noted. The knee-jerks are present, of normal intensity and equal on the two sides. The ankle-jerks are very difficult to obtain and there is no Babinski phenomenon. The biceps, triceps and supinator longus reflexes are all present and hyperactive, but equal on the two sides. The pain, temperature and epicritic senses are lost below the distribution of about the tenth dorsal nerve segment and there is some tenderness over the nerve trunks. The vibratory sense is present in both lower limbs. To-day the patient complained of some fulness of the abdomen and examination revealed a full bladder and on catheterization forty ounces of urine were removed. It was found necessary to catheterize the patient four times a day thereafter for several weeks. The urine showed a slight trace of albumin, a few white blood-cells, together with granular and hyaline casts.

Record by Days.—Dec. 1, 1912: The patient is much worse. There is a marked puffiness of the eyelids and face and he complains of pain in the joints, and a marked loss of strength in arms and hands. There is a loss of sensation below the innervation of the eighth dorsal nerve segment and the pain sense in the upper extremities is diminished. The knee-jerks have disappeared and the biceps, triceps and wrist-jerks have notably diminished since yesterday. A lumbar puncture was done and 6 c.c. of clear fluid removed under no pressure. The pipet count was normal and arsenic was detected in both the urine and spinal fluid by Dr. J. J. Pilcher of the pharmacology department of Western Reserve University.

Dec. 5, 1912: Patient is markedly jaundiced and has a slight decubitus on the right side; stronger in the arms but still unable to move the legs.

From this time on the patient began slowly to improve, the reactions to electricity, etc., varying somewhat from time to time. The jaundice cleared up about December 18 and January 1 the urine began to run of itself, but the patient was unable to control it. As the Wassermann reaction was strongly positive he was put on daily injections of mercury bichlorid one-fifth grain and about the middle of January he began to be able to move the thigh and leg muscles of the left leg and wiggle the toes of the right foot.

Second Examination.—By Dr. C. W. Stone of the neurologic department of the Western Reserve University, Feb. 2, 1913: Plantar stimulation of the left foot causes plantar flexion of the great toe with dorsal flexion of the second and third toes and plantar flexion of the fourth and fifth toes. Oppenheim and Schaeffer tests cause some reaction. There is a positive Mendel (Bechterew) on the left foot and no Babinski on either side, although suspicious on the left. The patellar reflexes are present, active and equal on the two sides. Ankle-clonus present on both sides, but more so on the left. Ankle-jerk is present on both sides. There is a dermatographia on both sides of the abdomen.

Sensation: Temperature as follows: Above the knee he perceives both heat and cold on the right leg and also below the knee for the upper two-thirds on the inside and upper one-third on the outside. In these areas it is uncertain, but below them neither is perceived. On the abdomen both hot and cold are distinguished above the umbilicus and below it on the right side, but both are uncertain on the left side below the navel. On the entire left leg both heat and cold give a sensation of warmth.

Pain: Complete analgesia of entire left leg, although patient feels touch of the pin but no pain. The pain sense is distinctly less on the right side below the middle of the thigh and becomes increasingly less as one approaches the foot.

Vibration: The vibrations of the tuning-fork are perceived in both legs, and on both limbs equally well.

Touch: Probably no diminution in the touch sense. Usually the brush feels the same on the legs as on the trunk though sometimes less. There is no disparity in the acuteness of the two sides.

Electrical Reactions: Galvanic. Quadriceps with a current of eighteen milliampères does not respond to KCC but does to ACC. It is better on the left than on the right side. The vastus internus with the same current responds to ACC, but not to KCC on the left side. Tensor fasciae femoris—ACC is greater than KCC on both legs, but KCC is absent on the left leg with 25 milliampères current. Peroneals—ACC is greater than KCC on both legs though KCC is present in both limbs.

Faradic Current: The quadriceps respond on both sides, but only with a strong current on the right side. The peroneals, gastrocnemii and solei all respond promptly.

Progress of Case.—Feb. 24, 1913: The patient is slowly but steadily improving. The decubitus is gradually closing in and the patient is around in a wheel-chair.

March 15, 1913: The decubitus is entirely closed in and the patient discharged. He has been taking daily injections of mercury biniodid one-fourth grain for a long time and his Wassermann reaction is now negative. Patient instructed to have daily massage at home.

April 8, 1913: Patient has been visited weekly and he is improved slowly. He finally is able to control the bladder and can now stand on his feet.

Diagnosis.—Arsenic intoxication due to idiosyncrasy or more probably to lack of elimination.

Case 3.—Miss E. F. G., patient with a luetic history, was referred by her family attendant for treatment by salvarsan. At the time of admission she was extremely nervous and had headache, but was otherwise well and weighed 106 pounds.

Treatment and Course.—Feb. 2, 1913, she was given an injection of No. 4 (0.6 gm.) neosalvarsan intravenously. The next day the patient began to complain of increased headache, general malaise and loss of appetite while she had a temperature of 102 F. with a pulse of 110. These symptoms kept up until February 6, when the patient had a temperature of 104 with a pulse-rate of 110 to 120, a slightly injected throat with a white blood-count of 3,000 and an enlarged and tender spleen. Otherwise the examination revealed nothing and a blood-culture was done. The next day the continuous fever began to drop and the patient felt better despite the fact that on February 8 the spleen was still enlarged and the white blood-count was 4,000. The blood-culture was negative. Patient was discharged February 11, well, the urine having shown nothing at any time.

Case 4.—Miss L. S., aged 21, weight 112 pounds, presented a small node-like protuberance on the anterior surface of the tibia of one year's duration, the nature of which was obscure. Previous history was good; patient's father died at 35 of pneumonia. The patient had been treated with potassium iodid but the discomfort continuing, the case came under my care.

Treatment and Course.—As two Wassermann tests at different times and by two competent serologists showed a positive reaction she was given on May 17, 1912, 0.45 gm. neosalvarsan intravenously. This was followed by severe reaction and a marked jaundice occurred on the third day. This disappeared in a few days and the patient returned home. No change in the nodule was observed. Two weeks later a second administration of No. 4 (6 gm.) neosalvarsan was given without untoward symptoms but without producing any change in the tumor notwithstanding that neosalvarsan was alternated with mercury.

In two other cases a slight jaundice has followed the use of salvarsan. In one case of pemphigus foliaceus, 0.4 gm. salvarsan intravenously was followed by no appreciable results.

FATALITIES REPORTED FOLLOWING USE OF SALVARSAN

Up to last November about 600,000 ampules of neosalvarsan and 3,000,000 of salvarsan[12] had been sold. Naturally with such a powerful drug, used in such a large number of cases, we must expect some unpleasant results; as nearly as can be ascertained about 124 deaths have been authentically reported to March, 1913.

In this country two other deaths, undoubtedly overlooked by foreign writers, have been described by Ruh[18] and Newmark.[9] These statistics do not include many other deaths in which physicians have not reported from fear of unpleasant results, imagined reflections on themselves, etc. Placing the deaths at 200, there has been about one death for each 2,000 injections, but, as we shall see, some of these should be omitted as they are thought not to be due to salvarsan.

FATALITIES DIRECTLY DUE TO SALVARSAN

From the symptomatology of these fatal cases they appear to belong to several types, more or less shading into one another. A few have been described in which the patient dies suddenly after the injection, having shown few or no symptoms. Probably the most common, however, is that of a subacute type coming on in a day or so with headache, weakness, vomiting, often incontinence of sphincters, coma, dyspnea, cyanosis and death in from three to four days. In this type one generally finds a serous meningitis and often some small ruptured vessels at the base of the brain. The French have reported this finding several times and say that often no other lesions are to be found.

In some of the cases, of which the one described by Ruh[18] can be taken as an example there is a total or partial suppression of urine, with albuminuria, hematuria and death. In the one reported by him the patient, five days after having had an intravenous injection of salvarsan, died from anuria and toxic symptoms of uremia. He found at necropsy evidences of a severe intoxication present mostly in the kidneys and liver, which showed degenerative changes and proliferation of the parenchyma—these changes being similar to those produced by experimental arsenic poisoning.

Busse and Merian's[19] case was also much like this and necropsy showed cerebral edema with hemorrhages, thromboses and inflammatory lesions in the white substance of the brain and cord. There was also an acute nephritis and hemorrhagic lesions in several organs. They concluded that their case was an acute arsenic poisoning as the kidneys showed extreme degeneration of the parenchyma with swelling and desquamation of the glomerular epithelium. The spleen also showed swelling of the pulp with hemorrhages and beginning areas of necrosis. Lesser[20] and later Lube[17] call attention to the presence of convulsions in some of the cases. In twelve of Lesser's eighteen cases the convulsions came on shortly after the injections and nine of these patient died; while in the other six the convulsions appeared later. Thus in one case eight weeks after the third injection the patient was suddenly seized with epileptic attacks lasting a short time. Later this patient had several injections of salvarsan but with no symptoms following.

Concerning the cause of these postoperative troubles it may be best first to give a brief survey of the opinions of different men after which they might be taken up more in detail. Emery[21] has during the past year been working on the influence of contaminated water on the organism when intravenous injections are given. He finds that even infinitesimal quantities of copper and lead in freshly distilled water are liable to cause toxic symptoms and he advises the use of Jena glass for the distilling apparatus so that none of these salts will be dissolved out by the water in the process of distillation.

Coming now to the question in detail, there is one class of ill results appearing very acutely after the injection, which can be explained as an acute arsenic poisoning and on that basis alone. Ruh's case was such a one and Busse and Merian's another. Darier's two cases can be explained most easily under this heading and unquestionably that of Wolff and Mulzer's; in fact, they admit it themselves. Hallopeau[23] feels, from his experience, that alcoholism predisposes to arsenic poisoning due to the changes in the liver and in his case he believes this had much to do with the fatal result.

It has been found by different investigators that the bulk of the neosalvarsan is excreted in the first three or four days and of course anything hindering this excretion, for example, cirrhosis of the liver, would predispose to an intoxication on the taking of the second dose. Wechselmann[24] believes the bad results are due to a retention of the drug in the blood from some cause and it may be that this took place in Case 2 of my series. Be that as it may, the recent work of von Marschalkó and Veszprémi[25] shows quite conclusively that the tolerated dose of 0.01 gm. salvarsan, 0.015 neosalvarsan, per kilogram, as determined by Hata for animals, is much too high. Animals receiving 0.015 per kilo died in several hours and those receiving from 0.011 to 0.012 gm. per kilo in two to two and one-half days. The necropsies showed the exact analogy with the so-called meningoencephalitis so much emphasized by the French—dotted hemorrhages at the base of the brain, stasis, hyalin thrombosis, and hemorrhages without inflammation. These findings have also been lately amplified by these men in another place. They find when less than 0.008 gm. per kilo is injected the animals always live. They conclude that all the deaths can be explained on the basis of an arsenic intoxication and in a later paper[26] urge that the dose of 0.4 gm. should never be exceeded.

According to some men these "neurorechutes" or "recidives" are seen most frequently in cases of cephalic chancres as in Case 1. Desneux and Dujardin[30] on Bayet's service saw seven cases of "neurorecidives" after cephalic primaries and they usually began with intense headache, as Werther and Benario[31] have already noted. They started in from one to four months after the injection, at a time when practically the last remnant of arsenic had been excreted, and these men considered that the cases were exclusively luetic in origin.

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[12] Darier, J.: Bull. Soc. franc. de dermat. et de syph., November, 1912.

[19] Busse and Merian: München. med. Wchnschr., 1912, No. 43, p. 2280

[20] Lesser: Berl. klin. Wchnschr., 1912, p. 593.

[21] Emery: Bull. Soc. franc. de dermat. et de syph., Nov. 7, 1912.

[23] Hallopeau: Gaz. d. hop., Feb. 15, 1912.

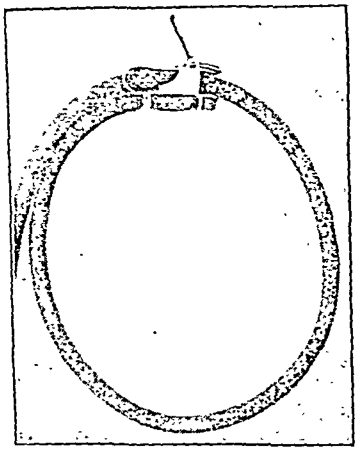
[24] Wechselmann, quoted by Darier; see Note 12.

[25] Von Marschalkó and Veszprémi: Orvosi hetil., 1912, Nos. 23 and 24.

[26] Von Marschalkó and Veszprémi: Archiv. f. Dermat. u. Syph., 1913, cxiv, 589.

[30] Desneux and Dujardin: München. med. Wchnschr. 1911, No. 23, p. 1245.

As to their true causation there is still some difference of opinion. Some believe they are due to a toxic action of the salvarsan on the nerves, while others think they have nothing to do with salvarsan. Again others believe that while they are of a luetic nature, yet the salvarsan, in its action on the nerves, has caused a *locus minoris resistentiae.* Still another group of observers, headed by Ehrlich himself, believes that they are due to the progressive germination of a few *unkilled spirochetes.* Neisser takes the ground that the salvarsan therapy has nothing to do with the "neurorecidives" except in this way—that in some persons, unfavorably influenced by the arsenic therapy, these nerve lesions come on earlier than they would otherwise. Benario has attempted to show that the same ill results were noted, and as frequently, after the use of mercury as after the beginning of salvarsan therapy. In concluding this consideration it seems evident that the "neurorecidive" or "neurorecurrence" is of a luetic nature, but it is hardly to be doubted that the salvarsan plays an important rôle both as to time and character of its appearance.



ACCIDENTS CLASSIFIED

Accidents following the use of salvarsan may be classified as follows:

1. Those coming on very shortly after the injection with symptoms of an acute intoxication and necropsy findings of serous meningitis, hemorrhages, and frequently lesions of the kidneys and liver, lesions such as one finds in experimental arsenic poisoning.

2. Those coming on in from two to four days with symptoms of nerve paralyses, at times deafness, dizziness, poor hearing and even loss of consciousness, due to the Herxheimer reaction. It is explained by the killing of the spirochetes with consequent loosening of their toxins, and resultant edema and swelling of the parts affected, causing severe damage in such uncompressible tissues as the brain or nerves running through an osseous foramen.

3. Those coming on within from several weeks to months after the injection with symptoms of nerve paralysis and to be classed (1) as a "neuro-exacerbation" or "neurorechute," in which there is the lighting up of a hidden process already working or (2) as a neurorecurrence "neurorecidive," in which there is a genuine starting up of a new lesion. Both these processes while luetic in character are associated with the arsenic preparations at least as to time and mode of their appearance.

CONCLUSIONS

I do not wish to convey the idea that the use of salvarsan is to be discouraged. On the contrary, I believe that when the drug is properly used and by experienced persons it is a most valuable weapon against the *Spirochaeta pallida.* To insure against untoward results, however, one must exercise care as to the selection of cases and after ascertaining that no physical disqualification exists, one should further exercise care in not giving too large doses. From my experience, I would advise that treatment be begun with a small dose and gradually worked up by succeeding injections not to be given oftener than once a week. Great care should be taken as to the purity and sterility of the distilled water. The reaction of the patient should be carefully watched and, if very severe, further injections should be given with *exceeding care.* In cases of cephalic chancres one should institute salvarsan therapy with the greatest caution. If these precautions are taken, the result will be with rare exceptions most gratifying and, if the drug is used in conjunction with mercury, the result will be much quicker and surer than with either alone. *Again, there* are many obstinate cases that will react only to this combined line of treatment. As to the relative therapeutic value of the old and the new salvarsan I have been unable to detect any difference.

Finally, every physician having had accidents from the use of salvarsan should consider it his duty to report them, for in this way only can we arrive at a fuller and better knowledge of this the last great stride in overcoming syphilis.

3618 Euclid Avenue

A SIMPLE TOURNIQUET

F. D. Austin, M.D., Charlotte, N. C.

This device is made of a piece of ordinary rubber *tubing* and a clamp from a fountain syringe. The illustration shows the details, making a description unnecessary.

GOLF-BALL BURN OF EYE

H. E. Thomason, M.D., Kansas City, Mo.

E. F., boy aged 13, in February, 1913, thrust his knife into the center of a golf-ball. Out spurted a liquid directly into the right eye. Dr. Lee Haynes, who was summoned, sent the boy directly to my office; he arrived about two hours after the accident. There was marked swelling of both conjunctivae, so that the lids were everted. Cornea was milky-white; only light perception was present. There was agonizing pain, for which a 4 per cent. solution of cocain was instilled. Patient was sent to South Side Hospital with instructions to use 1 per cent. solution of atropin sulphate, sterile olive oil and cold application, followed in twenty-four hours with hot. On third day I noticed a detachment of both palpebral conjunctivae. This I allowed to remain to prevent symblepharon while a new one formed. The conjunctiva was removed on the tenth day. The epithelial layer of cornea sloughed on the fourth day and was removed.

The result so far I consider good as there is only a slight symblepharon at outer and inferior angle of the eyeball. Vision unaided 20/40 with a sphere plus 1 20/30. There is a small leukoma on cornea at inner canthus. An ointment of 5 per cent. dionin has been the principal treatment since the acute symptoms have subsided.

317 Argyle Building.

What Is Courage?—The bravest men are not those who are insensible to physical fear, but those who master it by courage of spirit; the purest and noblest are not those who have never felt the temptations of the body, but those who have resisted them.—*The Outlook.*

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[31] Benario, J.: Neurorecidive nach Salvarsan und nach Quecksilberbehandlung, ein Beitrag zur Lehre von der Frühsyphilis des Gehirns, München, 1911.

THE JOURNAL OF THE
AMERICAN MEDICAL ASSOCIATION

535 DEARBORN AVENUE . . . CHICAGO, ILL.

Cable Address . . . . "Medic, Chicago"

Subscription price . . . . . Five dollars per annum in advance

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SATURDAY, SEPTEMBER 20, 1913

HAVE SPERMATOZOA OTHER FUNCTIONS THAN THAT OF FERTILIZATION?

Our widening view of the possibilities and omnipresence of immunity reactions in physiologic as well as pathologic processes gives us an understanding of the significance which may lie in a recent study of Kohlbrugge of Utrecht on the fate of spermatozoa in the female organism and their potential influence on both mother and offspring.[1] The prevailing idea has been that of the millions of spermatozoa introduced into the mammalian female — about two hundred million in the human — one single spermatozoon, more active or more fortunate than the rest, reaches the goal and becomes immortalized in a new being, while all the rest die and pass out through the route by which they have entered. It has been known to the zoologists that in at least some of the invertebrates the spermatozoa invade the entire body of the female, penetrating even the viscera, and sometimes perforating the cuticle from the outside to reach by this direct route the genital tissues. In some species, furthemore, it has been observed that not merely a single spermatozoon, but many spermatazoa, may enter the ovum.

At one time there did exist a belief, founded purely on speculation, that the spermatozoa of the mammal invaded the entire generative tract, and perhaps the entire body of the female; but this idea was current over a century ago, and entirely discredited in more recent times. Now Kohlbrugge has found evidence which seems to indicate that perhaps the ancients guessed better than their descendants reasoned. He has detected in such mammals as mice, rabbits, bats and in some other vertebrates the spermatozoa invading all the folds of mucous membrane in the uterus and tubes, penetrating the epithelium and invading the underlying connective tissue. He has also observed that they may enter the developing ovum for some time after the first stages of multiplication of the impregnated cell. The observed and possible effects of these activities of the spermatozoa are many. The cells of the uterine mucosa which have been entered by the sperm seem to be stimulated to growth, indicating that this may be a factor in the preparation of the mucosa for the embedding of the egg and the formation of the decidua. It is also possible that these foreign cells entering the tissues may lead to immunologic reactions of significance, such as the occurrence of corresponding diatheses in husband and wife, the reputed resemblance which develops in married couples, not only in psychic, but also in physical characteristics, and possibly other yet undetected biologic interrelationships. This is an almost untouched field which may yield important results when once worked over.

The entrance of additional spermatozoa into the fertilized egg may also have important results. Possibly they confer added stimulus to normal growth, or lead to abnormal developmental changes of importance for teratology; or, again, they might introduce either nutritive substances or pathogenic agents into the egg. In case of spermatozoa coming from a different male than the one who fertilized the ovum, *there are unlimited possibilities to be imagined in the way of adding characteristics of the second male, or modifying the growth of the ovum through its reaction to alien sperm, etc.* It would also be possible in this way for diseases to be present in the child which were not acquired from either of the actual parents. The simple observations of Kohlbrugge are of such a character as to stimulate speculation leading into remote fields; so much so, indeed, as to obscure the fact that they are as yet unconfirmed, and that the results ascribable to the wandering spermatozoa are entirely hypothetic. Even if the male elements do invade the female tissues and the fertilized and growing egg, it does not necessarily follow that any effects of importance result therefrom; but the process of generation is so mysterious that any new suggestions are bound to lead to extravagant speculation.

IS ALCOHOL A FOOD?

It has been extremely difficult in the past to approach the subject of the value of alcohol to the human economy in a way that would lead to an entirely dispassionate estimate of the part which it may play. The question is unusually complex because alcohol may affect the body physiologically or pharmacologically in a variety of ways quite apart from its possible rôle as a nutrient substance. The reply to an inquiry on the subject is likely, therefore, to be tinged with the impressions that are left by the particular aspect of the subject under consideration, sometimes without regard to other equally important considerations. The physician looking primarily for certain immediate responses which he desires to accomplish in a diseased organism may, for example, tend to overlook other more remote effects seemingly unrelated to his immediate interest. One writer will thus emphasize the beneficial features of the use of alcohol; another may with equal readiness see only its detrimental aspects. Again, an investigator, impressed with the dire consequences for which alcohol may be responsible in relation to the nervous system, may utterly overlook the ready oxidation of alcohol in the organism and the physiologic possibilities suggested thereby in respect to energy utilization. Questions of dosage are clearly appreciated in any discussion of the action of drugs; and every therapeutist well realizes that small amounts of toxic compounds, like arsenic or strychnin, may exert most beneficent effects under appropriate conditions. The discussion of the subject of alcohol, however, is all too frequently so pervaded with passion and partisanship that the open-minded student finds himself embarrassed in attempting to steer a safe course between bias on the one side and ignorance on the other.

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[1] Kohlbrugge, J. H. F.: Die Verbreitung der Spermatozoiden im weiblichen Körper und im befruchteten Ei, Arch. f. Entwcklngsmechn., 1912, xxxv [illegible]

In 1902 Atwater and Benedict furnished a notable contribution to the physiologic aspects of the alcohol question.[1] They investigated the influence of "moderate" amounts of alcohol on man—quantities equivalent to what would be supplied in a bottle of claret or in 6 ounces of whisky. It was clearly and conclusively shown that 99 per cent., that is, practically the entire amount, of such intakes of alcohol per day were actually oxidized in the body. The proportions of food and the several kinds of nutrients digested and made available for use in the body were practically the same in the experiments with and without the alcohol in the diet. In every case the law of conservation of energy was obeyed. The potential energy of the alcohol (which yields about 7 large calories per gram) was transformed into kinetic energy in the body as completely as that of ordinary nutrients, and ultimately left the body as heat, precisely as is to be expected. But more striking than these generalizations was the fact, clearly brought out by Atwater and Benedict, that alcohol is efficient in the protection of the body-fat from consumption. There was no evidence, from the point of view of energy, of any considerable difference between the alcohol and the isodynamic amounts of fat and carbohydrate which it replaced. The efficiency of alcohol in protecting body protein, though evident, was not equal in this respect to isodynamic quantities of the ordinary nutrients.

These experiments show that alcohol is burned up in the body like the other foodstuffs, but they by no means thereby prove that its energy may appear in the form of muscular work as well as heat. Herein lies a distinction frequently overlooked by those who are not thoroughly conversant with the subject of metabolism. A compound may be burned up and its energy completely converted into heat. But the living organism requires more than heat; part of the energy furnished to it must at some time be capable of conversion into movement—into muscular work—if the functions of the body are to be carried on. It has often been urged by the partisans of the anti-alcohol propaganda that alcohol can never function as a true nutrient because, granting that it can be oxidized in the body, its energy is never transformed into muscular work. At best, they remark, it furnishes useless heat to an already overheated organism. The classic experiments of Atwater and Benedict do not prove that alcohol may furnish the energy of muscular work, even though they make it "highly probable."

We often hear the statement made that the "alcohol calories" fail to serve any useful end when they are burned in the body. We are told that alcohol, in any amount whatever, is a poison. Poisons do not become essential integral parts of living cells; so that on this basis one may conclude that the calories represented by alcohol appear merely as waste heat without furnishing to the economy anything of real advantage when such a "poison" is burned therein.

Durig[2] of Vienna, a competent student of the problems of metabolism, has again approached the question of the extent to which moderate amounts of alcohol can really supplant carbohydrates in nutrition. He selected conditions presumably particularly favorable to the preferential use of the carbohydrate in the metabolism, in case the organism were really not adapted to the satisfactory utilization of alcohol. The subjects were given large amounts of sugar with and without the addition of alcohol. The experiments were so planned that if the combustion of alcohol merely leads to waste heat its products would be added to that of the sugar which was always available in abundance. The results seemed to show that there was no waste under these conditions. Despite the surfeit of sugar available it was spared from destruction for liberation of energy by the alcohol which was burned to replace the carbohydrate. It is sometimes asserted that such conservation of foodstuffs when alcohol is ingested is due not to an actual replacement of nutrients, but to the toxic inhibitory effect of the alcohol whereby all the metabolic processes are decidedly diminished. Nutrition is represented as being in a sense paralyzed. This view is combated by Durig.

In emphasizing these facts regarding the behavior of alcohol in nutrition one cannot point out too emphatically that they do not commit us to the dictum that alcohol is an excellent or even an advantageous food. To say that alcohol may be a food is not to deny that it is a dangerous one. If it is given too freely its oxidation is incomplete and, what is more important, the untoward nervous effects become prominent. In ordinary conditions of health there is no occasion for the use of alcohol, and its introduction into the regimen of daily life can scarcely be defended on the grounds of nutritive needs. Dr. Meltzer has said that "alcohol in health is mostly a curse and in sickness mostly a blessing." The conscientious physician is entitled to know the truth in regard to it. His prescription of alcohol should be based on a clear conception of its action and its limitations.

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[1] Atwater, W. A., and Benedict, F. G.: An Experimental Inquiry Regarding the Nutritive Value of Alcohol, Mem. Nat. Acad. Sc., 1902, vii, Sixth Memoir.

[2] Tögel, O.; Brezina, E., and Durig, A.: Ueber die Kohlenhydratsparende Wirkung des Alkohols, Biochem. Ztschr., 1913, l, 296.

"NATURAL" AND SYNTHETIC SALICYLATES

From the title of the Council on Pharmacy and Chemistry the natural but erroneous inference is probably drawn that it deals with laboratory matters exclusively, questions of therapeutics which must be answered at the bedside not being considered. The fact that laboratory investigation has often sufficed to fix the status of a preparation, the chemical evidence of its fraudulent character being sufficient to warrant no further investigation by the commission, is to a great extent responsible for this mistake. Questions of composition and pharmacologic qualities are determined by chemical analysis and animal experiments. Laboratory experiments must decide whether the claims are *true or false*. In some instances, however, laboratory investigations are not sufficient and attempts must be made clinically to show the true therapeutic worth of the product. In such cases, if the matter requires wider investigation than can be given by its clinical members, the Council submits the question to its Staff of Clinical Consultants, whose experience and judgment are acknowledged, and they determine whether or not the clinical evidence submitted is sufficient to sustain the therapeutic claims made. In this way every phase of the questions submitted to it is settled by the Council.

Some time ago the Council on Pharmacy and Chemistry authorized a cooperative investigation of a question which has long been disputed without conclusive results: Are the "natural" salicylates superior in any way to the synthetic products? The various steps of the investigation are reviewed in the report of the Council in this issue.[1] They involve, first, a chemical examination of the product; second, a pharmacologic examination, and third, a critical survey of the literature. The chemical examination of the products on the market showed no chemical difference between the natural and synthetic salicylates; the pharmacologic examination showed no difference in the action of the products; an analysis and critical survey of the whole literature on the subject showed that from previous studies there is no ground for the conclusion that the natural salicylates are superior in any way to the synthetic. With these preliminary data, it was justifiable to proceed to the clinical investigation. This was planned so as absolutely to avoid the factor of personal bias which has wrecked many similar investigations. A large number of clinicians, including many who had decided opinions on the question, were invited to participate, with the condition that they should not know the origin of the different samples used by them until after they had rendered their reports. A sufficient number responded to make the results representative. The conclusions are decisive and unmistakable. No investigator could distinguish which of the powders supplied to him were natural and which were synthetic. The collective tabulation showed that the natural and the synthetic products give almost mathematically the same percentage of therapeutic results, in fact, in all the phenomena recorded.

The question would certainly seem to be decided: Natural salicylates are in no way superior to synthetic salicylates. The value of cooperative clinical investigation of this and similar questions is well illustrated by these investigations. The decisive result of the report is due to the willingness and enthusiasm of the investigators, who deserve the highest credit and thanks for their collaboration with the Council.

A VIEW OF ANESTHESIA

Broadly speaking, the term "anesthesia" *may be used* to designate any temporary or reversible lowering or loss of the vital responsiveness, or of the normal automatic vital activity, under the influence of certain artificial substances or conditions. This property of complete reversibility, whereby the normal activities of the organism may completely return when the influence of the anesthetic has passed off, distinguishes it clearly from those irreparable losses of physiologic power which are allied to death. It is only natural that so unique a manifestation should incite investigation of the inherent nature of anesthesia. Consequently there have been various theories of anesthetic action.

The fundamental factor in anesthesia is a loss of what biologists term the irritability of cells or tissues. They no longer exhibit a characteristic response to stimuli to which response is ordinarily obtained. It would lead us too far to take into consideration here the many conditions which are known to alter or abolish the irritability of an organism. Modifications of temperature, certain electrical currents, fatigue and mechanical shock are among them. Irritability may be more easily modified, however, by the use of chemical substances than by any other means; and for the medical investigator interest here centers chiefly in a group of largely unrelated substances called anesthetics by the physician.

Many of the anesthetics are soluble in fats and fat-like compounds (lipoids) and likewise dissolve them. The Meyer-Overton theory of narcosis propounded a few years ago holds that there is a relation between the lipoid-solvent power of a large number of organic anesthetics and the intensity of their narcotic power; according to this the chief factor in determining the action is the coefficient of the relative solubility of the anesthetic in water and in lipoids, such as the nervous system contains in great abundance. *In other words*, for any series of fat-soluble compounds the narcotic action increases as the lipoid solubility increases and the water solubility decreases.

The view whereby this form of anesthetic action depends essentially on a modification of tissue lipoids has received wide-spread attention. There is much left undetermined thereby *with respect to* the further mechanism of anesthesia and the precise way in which alteration in the lipoid components of cells changes their irritability. Verworn, in particular, insists that anesthetics act primarily on the oxidative mechanisms of cells. It is well known that lack of oxygen usually is attended with a decrease in irritability, so that results closely resembling, if not identical with, anesthesia may be produced thereby. It is true that the rate of oxidation in active tissues may be lowered during anesthesia; but as Lillie, among others, has emphasized, this effect is rather a consequence than a cause of the lessened activity.[1] He adds that obviously whenever free oxygen is necessary to the normal activities of a tissue its withdrawal will arrest those activities; but the effects produced by lack of oxygen are not to be identified with anesthesia because of such incidental resemblances or parallelisms.

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[1] See page 979

Even for the practical aspects of anesthesia it is of no little moment to establish the fact that tissue asphyxiation or the suppression or prevention of oxidation processes is not the essential basis of anesthesia. How then are we to regard the antistimulating action of anesthetics? How is irritability suppressed by them? A partial explanation of this is the fact, which Dr. Lillie[1] of the University of Pennsylvania has recently emphasized anew, that the primary process in stimulation is a membrane process. The permeability of cells is modified or determined by membranes. According to Lillie, anesthetics produce their essential effects by modifying the properties of the semipermeable plasma-membranes of the irritable tissues, making these structures more resistant to changes of permeability than normally. Since variations of permeability are essential to stimulation, the irritable tissue is thus rendered temporarily insensitive or irresponsive.

In recording these statements we are not giving any final solution to the varied problems of anesthesia; but the seat of action of anesthetic compounds has been more definitely located. On the view championed by Lillie the membrane is a main controlling factor in cell processes; and by changing its state, whether by lipoid-dissolving anesthetics or otherwise, we may alter the entire physiologic activity of the cell.

THE GOVERNMENT AND RADIUM

The supineness of the United States government as compared with the attitude of some foreign governments in matters relating to the health and welfare of its citizens is perhaps nowhere better illustrated than in its relation to radium. Some time ago[2] we called attention to the fact that radium deposits of unusual value had been found in Colorado, but that they had already passed to a large extent into the hands of private owners who were exporting the most valuable ore to Europe. So far the United States government has taken no steps to secure to its citizens the use of this element which, notwithstanding the exaggerated and unwarranted claims made for it by certain commercial interests, promises to have a unique field of usefulness in therapeutics. The difference in the attitude of European governments on the subject is shown by the fact stated in the editorial referred to above, that the Austrian government immediately on the discovery of radium in St. Joachimsthal secured control of the mines producing radium and arranged for its scientific and medicinal utilization.

Although possessing no radium-producing mines, Germany recently has purchased a supply of radium and placed it at the disposal of some of its university hospitals. The popularity of this action has been shown by the comments of the German press; in fact, a portion of the latter is advocating that the German government take over the entire control of the radium used for medicinal purposes in Germany. Thus the *Kölnische Volkszeitung* states that "to allow the traffic in this unique medicinal agent to be controlled by private firms is to upset all ideas of culture and humanity; a condition of affairs in which private gain and speculative interests are allowed to come into conflict with the health of the people is not to be tolerated." Yet the United States is allowing the radium found on its public domains to be monopolized by private persons without so far having made any provisions for securing to its citizens any benefit from it.

Aside from the foregoing considerations, however, a special responsibility rests on the United States to investigate not only the occurrence but also the usefulness of radium and radio-active waters, for the government itself has taken the lead in exploiting, in an entirely unjustified manner, the radio-activity of the waters of Hot Springs, Arkansas. These springs are the property of the federal government, and the latter for some time has been advertising that the waters owe their value to their radio-activity—a claim that has never been verified; in fact, the degree of the radio-activity of these waters has never, to our knowledge, been made public, although it seems that the Interior Department, which has jurisdiction over the springs, is in possession of information on this subject. The late Major Hallock, medical director of the springs, in a paper presented at the Minneapolis meeting,[3] called attention to the efforts which had been made to secure an investigation of the therapeutic value of the waters; the bill before Congress providing for such an investigation was never reported from the committee, and it is said that the failure of the committee to act on it was due to the opposition of the representatives in Congress of certain purely local interests at Hot Springs.

Thus our national government is not only allowing the deposits of what is already known to be a therapeutic agent of value to fall into the hands of private commercial interests, but also is actually a party to the exploitation of "radio-active" waters in a manner for which there is at present no justification.

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1. Lillie, R. S.: The Physicochemical Conditions of Anesthetic Action, Science, June 27, 1913, p. 859.
2. Radium in the United States, editorial, The Journal A. M. A., June 14, 1913, p. 1882.
3. Hallock, Harry M.: Some Aspects of Hydrotherapy in the United States, The Journal A. M. A., July 26, 1913, p. 260.

THE GOUT SITUATION

It is at times decidedly discouraging to be confronted with the practical problems of the management of a long-known and widely distributed condition like gout, and to feel how inadequate our actual knowledge of it still remains. Only when we put aside all inherited beliefs and acquired prejudices and take a purely objective survey of the established facts does a wholesome realization come of the substantial progress made where chaos has seemed to reign. For the sake of this satisfaction, if nothing more, it is well to take account from time to time of the status of our established information and to gain the impetus for better results which comes from well-digested knowledge.

What are some of the accepted facts, in distinction from transitory theories, concerning gout? The fundamental one is that the gouty deposits are actually composed of salts of uric acid and that as a rule the blood of gouty subjects discloses a larger content of uric acid than does the circulating fluid of normal individuals under the same dietary regimen. It may be assumed, furthermore, that the increase in the proportion of uric acid in the blood has some bearing on the deposition of the urates. In gout there are unquestionably also certain localized tissue changes which play a decisive rôle in the precipitation phenomena at the very seat of their exhibition.

We are thus brought to the question of the possible relation of the accumulation of urates to the manifold symptoms of gout, the severe crises and characteristic "attacks." Is it true that uric acid is *per se* the instigator of these diverse manifestations? Let us frankly admit that despite the popular notions on the subject, the exaggerated pronouncements of writers like Haig, and the vague convictions of most physicians, there is no conclusive proof available to substantiate a direct pathogenic relation between uric acid and gout. It is not inconceivable that in this condition, the organism is under the influence of peculiar functional disturbances which have their outward expression in the behavior of the uric acid. Thus instead of the latter substance it might be these fundamental altered processes, themselves the occasion for the abnormal uric acid manifestations, which are the real causes of the disease disturbances set up in gout.

On the other hand, various circumstances, if nothing more, suggest a more direct relation between uric acid and the acute attacks of gout. These crises have been observed to ensue after the liberal feeding of uric acid precursors (as in sweetbreads), and after their sudden liberation in the cellular disintegrations attending the crises of pneumonia or following intensive Roentgen-ray treatment. Again, it is known that the incidence of the gouty attacks follows that of marked changes in the output of urates in the urine. The excretion is diminished before and heightened after the attack. Finally, therapeutic relief is actually obtained by the use of drugs which as a matter of fact do facilitate the excretion of urates. We can scarcely believe that all of these circumstances are to be interpreted as mere coincidences rather than as pointing to at least some causal property on the part of uric acid in the genesis of gouty conditions.

Whatever the ultimate outcome of these attempts to establish the true relation of uric acid to gout, the differences in the behavior of uric acid in the normal and the gouty organism still call for interpretation. Here, too, there is room for divergent hypothesis. It may be that the solubility of uric acid in the organism has become modified by impending conditions; or the metabolism which leads to the formation of uric acid may experience a decided upset; or the eliminating functions may be depressed by factors involving the organs of excretion, the kidneys. Each of these possibilities has been subjected to careful scrutiny and extensive investigation in the past few years. New ideas about the conditions governing solubility in solutions like the blood and tissue fluids rich in colloids have been introduced. The part played by the alkalies has been variously interpreted; but amid all the vicissitudes of theory the practical efficiency of their use has not been overthrown. As for the metabolic explanations of gout, we believe that the consensus of present opinion will point to uric acid as an end-product rather than a mere stage in purin metabolism in man.[1] Recent investigation, particularly in American laboratories, has served to emphasize new and unsuspected steps and stages in the conversion of nucleic acid compounds into the final uric acid, and to divorce purin metabolism completely from that of other nitrogenous compounds. Perhaps the kidneys themselves must assume some of the burden of responsibility for the occasional accumulation of uric acid in the blood in disease. If so, they would seem to show extreme selective action in respect to their pathologic functions.

So long as the precise nature of the metabolic upset in gout is not definitely made out, all therapeutic measures must be based in large degree on the teaching of experience. Both this and purely theoretical considerations have justified the withdrawal of uric acid precursors from the diet and the introduction of the so-called purin-free dietaries in gout. In the attempt to accomplish such changes in regimen, an exaggerated importance has now and then been given to minor details. The extreme enforcement of exclusive diets has little therapeutic justification, particularly when it offends the tastes of a sensitive patient. The ever-present debates about the relative values of white and dark meats involve at best insignificant milligrams of inconsequential distinction. Common sense is as valuable in dietetics as elsewhere. But it is as incumbent on an up-to-date physician to know what foods contain the purin precursors of uric acid and what do not, as it is to know the latest drug advertised to dispel this objectionable excretory product. So long as a further basis for therapeutic innovations is not forthcoming it is well to bear in mind not only the desirability of diminishing the production of the reputed *materia peccans*, but also of sparing the entire organism, which may be the seat of overwork from perverted processes, from undue metabolic work. This may be accomplished by reasonable moderation in the diet as a whole, by conservative physical therapy, and by a careful mode of life. As Minkowski remarked at the recent International Congress for Physiotherapy, we need not underestimate the value of purely empiric rules in the treatment of gout. But if it is admitted that there are many traditional truths in this field, we may hasten to add that there are likewise many errors sanctioned by tradition—errors which have maintained their prestige solely because they are not easily disproved.

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[1] Uric Acid, editorial, The Journal A. M. A., Aug. 17, 1912 p. 545.

Current Comment

THE SIGNIFICANCE OF FORMIC ACID EXCRETION

Recently we called attention to the interest which has of late been aroused in scientific laboratories in the occurrence of formic acid as a constituent of the urine.[1] Inasmuch as this substance, H.COOH, is an extreme product of oxidation carried almost to the final stage of carbon dioxid formation and can be obtained outside of the body by the oxidation of diverse materials, it requires no unreasonable assumption to postulate that it may also arise in the organism in the course of the oxidation of fats, carbohydrates or proteins. First of all, however, it is necessary to divorce facts from fancies. The prominent fact which all the more recent investigators have confirmed is the occurrence of formic acid as a usual, rather than merely a casual, component of the urine. It is found in health and diseased conditions alike; and the variations in its output have of late been studied assiduously in the hope both of correlating them with determinable pathologic processes and of learning what is the antecedent of formic acid in metabolism. In this country Dakin in particular has discussed the rôle of the compound as an intermediary stage in the catabolism of food substances and their derivatives.[2] In the earlier stages of the development of any theory the statistics of the subject are of fundamental importance. Hence it seems worth while to report the newest contributions in reference to the urinary excretion of formic acid. Dr. Strisower[3] of the First Medical Clinic in Vienna—one of the latest to undertake the study of the subject—agrees with those who believe that formic acid is a normal intermediary product of metabolism. According to him the average daily output in the urine is about 13 mg. In contrast with some of the earlier observers, Strisower has not noted any striking variations that can be attributed to specific dietary components. There are numerous diseases of the most diverse types in which the quantitive features of formic acid excretion appear to be not unlike those of normal man. In conditions attended with asphyxial symptoms, however, the output under this diminished oxidative capacity is reported to be larger than usual. The Vienna investigator agrees with several of his predecessors in noting an increased excretion in diabetes which he interprets as a sign of a disturbed metabolism of fats in this disease. Without entering into the intricate details of chemical argument we may now summarize the current opinions by the statement that formic acid may probably be an oxidative derivative of all the foodstuffs in common. Like the acetone compounds and lactic acid, for example, it is one of the simpler derivatives which "crop out" in the course of the disintegration of the larger molecules that furnish energy to our cells.

ANAPHYLAXIS AND PROTEIN DERIVATIVES

According to the most popular current theory of the genesis of the phenomena which characterize anaphylaxis, the reinjected protein or the tissue protein, as the case may be, undergoes a sort of digestive cleavage whereby toxic fragments are liberated within the organism. Vaughan and his collaborators in particular have championed the general view according to which such toxic degradation products derived from proteins initiate the symptoms of anaphylaxis. Drs. Auer and Van Slyke of the Rockefeller Institute for Medical Research have reasoned that if this explanation is tenable it ought to be possible to detect protein derivatives in those organs in which the failure to function leads to death in anaphylaxis. Accordingly, they have made chemical examinations of the lungs of guinea-pigs which exhibit a very typical permanent distention when death has occurred by anaphylactic shock. Their investigation[1] of this organ in which, according to the theory as outlined, the occurrence of protein cleavage products might be postulated, was negative in its outcome. Auer and Van Slyke point out in consequence that their experiments offer no support to the assumption that proteolytic cleavage products play an important rôle in the actual fatal serum anaphylaxis of the guinea-pig. We believe that a working hypothesis should be abandoned when facts are disclosed which are in obvious opposition to it. It would surely be unwarranted, however, to give up the very fruitful theory of Vaughan on the basis of limited negative evidence such as has just been recited.

TYPHOID FROM WATERCRESS

It is apparent that an attempt to trace typhoid infection to the use of uncooked vegetables such as lettuce, watercress and celery is likely to succeed only under rather peculiar conditions. Ordinarily the distribution of such articles of food to a large circle of consumers, and the difficulty of discovering, several weeks afterward, that such things were eaten, and by whom, are facts that conspire to render us ignorant of the real frequency of such sources of infection. A remarkable typhoid outbreak apparently due to polluted watercress has recently been reported from Philadelphia.[1] At a wedding breakfast, June 24, with forty-three guests in attendance, nineteen persons ate watercress sandwiches. Eighteen of these were ill, July 22, with typhoid fever, only two of them being in Philadelphia at the time, while the other sixteen were scattered in suburban territory and in summer resorts along the Atlantic coast as far away as Maine. Investigation by the Philadelphia Bureau of Health showed that the watercress had been secured from a farm on which the sanitary conditions were quite unsatisfactory. While the typhoid bacillus was not isolated from the cress-bed, all the other circumstances of the outbreak afford strong reason for suspecting watercress to be the vehicle of infection. It may be recalled that an outbreak of typhoid in Hackney, London, in 1903, was likewise attributed to watercress infection, although the evidence in that outbreak was not so convincing as that in the one just cited. Infection by celery has also been reported.[2] Students of epidemics will have their attention still more strongly drawn by the Philadelphia case to the possibility of infection from such sources.

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[1] The Significance of Formic Acid in the Urine, editorial, THE JOURNAL A. M. A., Sept. 6, 1913, p. 774.

[2] Dakin, H. D., and Wakeman, A. J.: Formic Acid as an Intermediary Substance in the Catabolism of Fatty Acids and Other Substances, Jour. Biol. Chem., 1911, p. 327. Dakin, H. D., Janney, N. W., and Wakeman, A. J.: Studies on the Conditions Affecting the Formation and Excretion of Formic Acid., *ibid.*, xiv, 341.

[3] Strisower, R.: Ueber die Ausscheidung der Ameisensäure im menschlichen Urin in physiologischen und pathologischen Zuständen, Biochem. Ztschr., 1913, liv, 189.

[1] Auer, J. and Van Slyke, D. D.: Eiweissspaltprodukte und Anaphylaxie, Zentralbl. f. Physiol., 1913, xxvii, 435.

THE EXCRETION OF MORPHIN

It scarcely need be emphasized that the physiologic fate of drugs employed freely in medicine deserves a most thorough investigation. To use therapeutic agents intelligently presupposes some precise knowledge of their function; and it ought also to include an understanding of what happens to them as well as to the body on which they exert their specific activities. Are they modified or destroyed in the organism? How do they or their derivatives leave it, or are they, perchance, stored up or deposited somewhere in the different tissues and organs? In the case of certain chemical substances, particularly those of inorganic matter, a partial or complete answer can already be given to such questions. In the pursuit of this information many facts of new interest have been discovered, as for example the importance of the intestine as a place for the elimination of certain elements like iron, calcium, etc. Regarding the transformation of the alkaloids in the organism, only the beginnings of an exact systematic understanding have been developed. Yet it is precisely in this group that much helpful information is to be expected. The interpretation of the peculiar phenomena of habit and tolerance in the use of some of the alkaloidal drugs presupposes exact knowledge of their fate; the problems of repeated doses involve an appreciation of possible retarded excretion and consequent cumulative action. In the case of morphin, one of the most widely used alkaloids and likewise one of the most abused, the supposition has long prevailed that it is not excreted by the kidneys to any noteworthy extent, but that in so far as it leaves the body unchanged this alkaloid is eliminated through the intestinal tract. For this reason little attention has of late been paid to the urine whenever it has, for any reason, seemed desirable to search for morphin in the organism. A careful reinvestigation of the excretion of morphin conducted at the pharmacologic institute of Heffter in Berlin[1] with more approved methods of quantitative analysis indicates that it will be necessary to revise our beliefs in this matter. As much as 39 per cent. of the morphin introduced into the body may reappear in the urine, so that evidently the participation of the kidneys in the excretion of this alkaloid is by no means negligible.

A SPECIFIC FOR CONTAGIOUS ABORTION IN CATTLE

The contagious abortion in cattle has proved to be one of the most costly diseases to which agriculture has been subjected. Methods of prevention have been under investigation for some time without great promise of eradicating the infection. What appears like a specific against the disease has been found by Dr. Taylor of the Montana Agricultural Experiment Station[2] in phenol (carbolic acid), either fed in solution or injected hypodermically. He observed that cows as a rule will eat with relish as much as 750 c.c. of a 4 per cent. solution of phenol in feed daily; but hypodermic injection as a treatment in an infected herd involves less labor than feeding. The method used with range cattle was to run them into a chute and inject 10 c.c. of 4 per cent. phenol under the skin just behind the shoulder-blade every two weeks. In cases of impending abortion, phenol can be injected in sufficient quantities to cause staggering gait and dilatation of the pupil of the eye with no apparent unsatisfactory after-effects. All males used for breeding purposes should also be treated, because the disease may be transmitted through the medium of the male unless proper precautions are observed. In human therapy we have come to adopt an attitude of extreme caution toward "specifics" for infections. What is reported in a government publication, however, as a successful procedure is entitled to receive publicity.

Medical News

COLORADO

Personal.—Dr. Leonard W. Ely, Denver, has been appointed associate professor of orthopedic surgery and Dr. Ralph W. Majors, instructor in pathology by the board of trustees in the Leland Stanford Jr. University, San Francisco.

Organization of Medical School.—At a meeting of the faculty of the University of Colorado, School of Medicine, September 1, under the new plan of organization adopted by the board of regents, the following groups were elected for the coming year: Surgery, Dr. Charles B. Lyman, chairman, and Profs. J. R. Arneill, S. G. Bonney, Cattermole, Gilbert, J. N. Hall, Moses Kleiner, Edwin J. Rothwell, Wm. H. Sharpley, Charles F. Shollenberger, Charles B. Van Zant and Herbert B. Whitney; eye, ear, nose and throat, Dr. William C. Bane, chairman, and Profs. Melville Black, John Chase, David H. Coover, Edward Jackson, John M. Foster and Robert Levy; obstetrics and gynecology, Dr. Charles S. Elder, chairman, and Profs. Thomas M. Burns, Walter A. Jayne, Francis H. McNaught and Thomas E. Taylor; specialties, Dr. George H. Stover, chairman, and Profs. Samuel B. Childs, William H. Davis, Arthur J. Markley, Newton Wiest, George E. Neuhaus,

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[1] Engineering News, Aug. 14, 1913.

[2] Morse: Report State Board of Health of Massachusetts, 1899, p. 751.

[1] Kaufmann, Asser W. Ritter von: Ueber die Ausscheidung des Morphins im Harn, Biochem. Ztschr., 1913, lv, 161.

[2] Taylor: Bull. 90, Montana Agric. Exper. Sta.

H. T. Pershing and C. L. Pershing. The fundamentals group will be divided into two sections under Drs. Carbon Gillaspie and Washburn of Boulder, chairmen; and Profs. Burnett, Clough T. Boulder, F. Gillett, Denver; Byles, Ekeley, Mitchell, Peebles, William C. Hensen, A. R. Boulder, Emley B. Boulder, James C. Boulder, Queal, Todd and Ross C. Whitman, Denver.

ILLINOIS

Addition to Beverly Farm.—A twenty-room addition to the buildings of Beverly Farm, Godfrey, has been completed. This gives the farm a capacity for sixty-five patients.

Personal.—Dr. S. M. Wylie, Paxton, was the guest of honor at a banquet given by the members of the Bi-County (Ford-Iroquois) Medical Society at Gilman, September 4.——Dr. C. O. Molz, Murphysboro, sustained a fracture of the left shoulder and injuries of the hip by the overturning of his automobile, August 31.——Dr. E. H. Butterfield, Ottawa, for sixteen years county physician, announces his retirement from the practice of medicine.——Dr. A. S. Wall, Champaign, is reported to be ill in the Julia F. Burnham Hospital.——Dr. J. M. Evey, who has been ill in the Monmouth Hospital, is reported to be improving slowly.——Dr. W. A. Dew, Belleville, is ill with an infected wound of the hand.——Dr. S. V. Balderston, health commissioner of Evanston, has resigned.——Dr. and Mrs. Walter Hoffman, Mount Morris, have returned from Europe.——Dr. J. F. Percy, Galesburg, has returned from abroad.——Dr. and Mrs. Otis Trotter and daughter, Quincy, have returned from Europe.——Dr. and Mrs. John A. Koch, Quincy, sailed from Europe, September 20.——Dr. John E. Allaben, Rockford, has returned from abroad.

Chicago

New Officers.—Chicago Medical Women's Club, September 10: president, Dr. Effie L. Lobdell; secretary, Sadie Bay Adair.

Personal.—Dr. G. W. Torrey was exonerated by a coroner's jury September 9 after inquiries into the death of Mrs. Elizabeth Bird, who was struck by Dr. Torrey's automobile, September 3.——Dr. and Mrs. Cassius C. Rogers have returned from Europe.——Dr. Truman W. Brophy has been decorated by the French Minister of Public Instruction on account of his work on oral surgery.

KENTUCKY

Personal.—Dr. James M. Ray, Louisville, has returned from abroad.——Dr. J. D. McConnell, Shady Grove, is under treatment in a hospital in Evansville, Ind.

Extend War Against Tuberculosis.—The executive committee of the State Tuberculosis Commission met in Frankfort, September 2, and took steps toward active county campaigns to raise interest in the establishment of sanatoria for tuberculosis. It was decided to employ two men this fall, one to conduct a campaign in Henderson County and the other in Fayette County.

NEBRASKA

Personal.—Dr. Robert Percy Jensen, South Omaha, was operated on at the Omaha General Hospital, August 30, for appendicitis, and is reported to be improving.——The office of Dr. Joseph X. Campbell, Stamford, was destroyed by fire, August 27.——The residence and office of Dr. James C. Andersen, Hayes Center, was burned September 3.——Dr. Nellie Deffenbaugh, Grand Island, on September 5, assumed the superintendency of the State Tuberculosis Hospital.

Hospital Staff Selected.—Dr. John E. Summers, Omaha, chief of the staff of the Douglas County Hospital, has selected the following staff: Drs. Charles McMartin, Alfred Schalek, John W. Hellwig, Herbert C. Sumney, Arthur C. Stokes, O. T. Schultz, Alfred F. Tyler, John B. Potts, Harry L. Arnold, Alexander G. Young, Joseph M. Aiken, William H. Mick, Andrew B. Somers, Frederick J. Wearne, Rudolph Rix, Palmer Findley, Robert R. Hollister, Hugh W. Weightman, Rodney W. Bliss, William F. Milroy, Adolph Sachs, Arthur D. Dunn.

Medical School in New Home.—On November 9, the University of Nebraska School of Medicine will move from Lincoln into a new building at 42 Second Street and Dewey Avenue, Omaha. The building has been erected at a cost of $115.000 and is almost completed. The new members of the faculty coming to Omaha are: Profs. A. A. Johnson and Oscar T. Schultz from Western Reserve University, Cleveland; Prof. Claude R. Michell, physiology; Prof. C. W. M. Poynter, Lincoln, anatomy; Prof. A. E. Gunther, physiology and pharmacology; Prof. Irving S. Cutter, Lincoln, biologic chemistry and director of laboratory work, and Prof. W. A. Willard, the microscope. The following additions have been made to the clinical staff: Dr. John E. Summers, surgery; Drs. Ray Crummer, Omaha, and E. L. Bridges, Omaha, medicine, and Dr. J. P. Lord, Omaha, orthopedic surgery.

NEW YORK

New York City

Railroad Accidents Increase.—The report of the Public Service Commission shows that for the month of July there were 29 deaths from railroad and street railways in New York City, exactly the same number as for the corresponding time of last year. There were 197 persons seriously injured. Altogether there occurred during the month of July 7,884 accidents of various kinds, including 310 persons struck by cars, 1,152 vehicles struck by cars and 320 derailments.

Death-Rate in Hospitals Increases.—The report of the Health Department for the week ending September 13 shows a marked increase in the number of deaths in the hospitals of the city compared with a similar period of last year, but a corresponding decrease in the number of deaths in the tenements. This is interpreted as indicating that the people are coming to appreciate the benefits of hospital care. The total death-rate of the city for the week under consideration was 12.17, as compared with 12.39 for the corresponding week of 1912. There was an increase in the number of deaths from Bright's disease and heart diseases, while there was a marked decrease in the number of deaths from pulmonary tuberculosis.

PENNSYLVANIA

Scarlet Fever Closes Schools.—Owing to thirty cases of scarlet fever in the Sugar Notch Borough, the schools have been closed and the town practically quarantined.

Reading Fight Tuberculosis.—Through the efforts of Miss Mary Parvin, the school lecturer of the Reading Tuberculosis Society, a message on school and home hygiene has been delivered to thousands of children and transmitted by them to their parents. Talks are given to children in the sixth, seventh and eighth grades and the question method is used.

Philadelphia

Grand Jury to Investigate Dumping of Garbage.—The Federal Grand Jury convened on September 15, to probe the dumping of garbage in the Schuylkill River. Jacob L. Havener, Jr., superintendent of the American Product Company, has been held under $800 bail for court by Commissioner Edmunds, in the federal building, on a charge of having dumped refuse into a navigable stream. The minimum penalty for the offense charged is a fine of $500 or thirty days imprisonment, or a maximum penalty is $2,500 fine and one year imprisonment.

School for Cripples Opens.—The special school for cripples in the Horace Binney annex of the McCall School at Sixth and Spruce Streets opened September 11, and a bus made the rounds of the section of the city between Christian and Lehigh Avenue and Broad Street and the Delaware. Everything that will contribute to the comfort and safety of the children has been arranged. The classroom is directly at the entrance of the building, their classes will be dismissed fifteen minutes early and at noon they will be served with penny lunches by the Starr Garden Association.

Dental Dispensaries Have Additional Surgeons.—Director Neff of the Department of Public Health and Charities, has appointed the following dental physicians to have charge of the two additional dental dispensaries that have been established for the benefit of public schoolchildren: Drs. Louise Schembs, Louis Jacobs, Armin T. Fellows and Edward K. McPherson. The successful candidates were the first four on the civil service eligible list for such positions, which pay $700 each. The new dispensaries will be established at the Thomas May Pierce School at Twenty-Third and Cambria Streets, and at the William B. Hanna School at Fifty-Eighth and Media Avenue.

To Sterilize All Water for Public Schools.—Sterilization of drinking water in the public schools, especially in the district east of Broad Street and south of Allegheny Avenue, is planned by Dr. Walter Cornell, chief medical inspector of the public schools, to guard against further spread of typhoid fever among schoolchildren. By an investigation and survey made last June by Dr. Samuel G. Dixon, State Health Commissioner, it was learned that the majority of victims of typhoid fever were among the schoolchildren. The number of new cases of typhoid reported to the Bureau of Health during the week ending September 13, was 71 as compared with 47 for the week previous.

New Institutions Authorized.—The wise initiative of the medical profession of Philadelphia and Pennsylvania has finally brought into legal existence large new institutions that will bring the city and state well into the advance along social lines: Mentally defective women of childbearing age, of whom at least 15,000 are known to be within the state, will now be permanently segregated in a great farm colony in a remote mountain forest reserve, thus preventing further multiplication. A home for alcohol and drug habitués, long agitated, is provided for in another forest reserve as, elsewhere, is an industrial home for women. Not "paths" of any kind or Christian Scientists or other self-seekers but everyday doctors are the plodders who thus work for and aid the public, just as in all other great social movements.

TEXAS

New Building for Sanitarium.—The Texas Baptist Memorial Sanitarium, Dallas, has called for bids for the erection of an additional building, 40 by 90 feet, two stories in height, of fireproof construction, to cost about $15,000.

Inspection at Mexican Ports.—As the result of a conference with Dr. Ralph Steiner, Austin, state health officer, acting state quarantine officer Dr. E. S. McCain, Galveston, has proceeded to Tampeco, Mex., to take charge of the inspection of Americans desiring to leave that country.

New Hospital Building.—The State Medical College, Galveston, is to erect a nurses' home for which $65,000 was appropriated by the last legislature. As the result of this, the fund of Mrs. R. Waverly Smith and John Sealy, Galveston, of $80,000 for a new building for the John Sealy Hospital for white women patients, becomes available.

Free Clinic Opened.—The Physicians' Free Clinic Association opened a clinic at 211 Commerce Street, Fort Worth, September 1. The following physicians are members of the staff: Drs. W. M. Trimble, Eugene Hall, O. L. Jones, Webb Walker, E. C. Axtell, P. L. Hooper, D. C. Rumph, T. G. Rumph, Ross Trigg, F. G. Sheddan, H. O. Brannan, J. T. Montgomery, J. L. Cooper, Wallace B. Smith, C. F. Hayes, J. W. Kuykendall, J. D. Mitchell, R. O. Braswell, Alden Coffey, J. H. McLean, E. L. Myrick, R. H. Gough, C. H. Pember, Crittenden Joyes, S. J. Brownson, G. E. La Beaume, W. D. Littler, John Potts, F. E. Rushing, M. E. Tadlock, W. C. Rountree, G. T. Allison, A. R. Hays, Field Farrar, C. E. Waller, J. T. Edwards, C. A. Ward and Nugent brothers. Dr. R. H. Goff has been elected president of the clinic; Drs. Field Farrar and D. C. Rumph, vice-presidents, and Dr. J. L. Cooper, secretary-treasurer.

Personal.—Dr. Henry Hartman, assistant health officer and bacteriologist, Austin, has resigned to accept a position as head of the pathologic department of the University of Texas, Galveston.——Dr. Z. F. Lillard, has been elected a member of the Board of Health of Houston, vice Dr. John T. Moore, resigned. ——Dr. William M. Moore, Paris, was operated on at the Aiken Hospital, September 3.——Dr. I. L. McGlasson, state quarantine officer, Galveston, has returned from abroad.——Dr. Joe Shelton, Waco, has been appointed chief surgeon of the St. Louis, Brownsville and Mexico Railway Company with headquarters at Corpus Christi.——Dr. C. H. McCollum, Hico, has gone abroad.——Dr. T. T. Jackson, San Antonio, has been appointed a member of the State Board of Health, vice Dr. A. A. Ely, Galveston, recently appointed a member of the board of regents of the University of Texas.——Dr. R. W. Noble, Temple, fractured his left arm while cranking his automobile, recently.——Dr. W. H. Betts, Fort Worth, was attacked by a patient and seriously injured, recently.

CANADA

Provincial Reciprocity with Great Britain.—Reciprocity in medical licenses has now been in force for some time between Great Britain and the following three Canadian provinces, Nova Scotia, Quebec and Prince Edward Island. New Brunswick is the latest province to join in this arrangement and it will very shortly be put into force.

Provincial Medical Board of Nova Scotia.—At the recent annual meeting of the Provincial Medical Board of Nova Scotia, a resolution was passed agreeing to accept the registration certificate of the registrar of the Medical Council of Canada, and without further examination, will register the holder thereof, on furnishing proof of identity and paying the necessary provincial registration fee. At the same time the board passed a resolution deprecating the fact that one province, British Columbia, on account of existing local legislation is unable to accord the same general recognition to all holders of the Dominion Medical Council's certificate. During the past year there were ten additions to the register of Nova Scotia and ten erasures on account of death, leaving the numerical strength of the register of that province as it was at 671. Of this number only about 440 are residents in Nova Scotia, the remaining number being chiefly in the United States. Dr. John Stewart, Halifax, was reelected president, and Dr. A. W. H. Lindsay, Halifax, registrar.

Hospital News.—From the leper hospital at Tracadie, N. B., two patients have recently been discharged. One man aged 39 left a year ago after having received twenty injections of nastin. Two subsequent examinations show him remaining well. The other was a man of 67 years, discharged in November last. He had received sixty injections in all and remains in good health. The physician now in charge of this government institution is Dr. Langis.——Prince Edward Island is to have a tuberculosis sanatorium through the generosity of the Hon. Charles Dalton. Dr. A. F. Miller, superintendent of the Kentville, N. S. sanatorium, will assist in selecting site and erection of building.——Three new wings are being added to the Children's Memorial Hospital, Montreal.——The provincial hospital for the insane at Battleford, Saskatchewan, is nearly completed. Dr. J. W. McNeil, Hanley, Sask., is to be the superintendent.——The Dominion Government is building a hospital and school for Indians at The Pas, at a cost of $76,000.——A hospital is to be built at Comox, B. C., by the Sisters of St. Joseph.

LONDON LETTER

(From Our Regular Correspondent)

London, Sept. 6, 1913.

The Investigation of Pellagra

Dr. Louis Sambon, who was twice sent to Italy by the pellagra investigation committee, has now gone on a third expedition to study the disease in America and the West Indies. In the United States he will meet Dr. Stiles and others who have devoted themselves to the study in that country. The cause of pellagra was long held to be due to the consumption of damaged maize, since it is in maize-eating countries that it prevails; but Dr. Sambon's theory, which is based on carefully thought-out epidemiologic grounds, is that pellagra, like malaria, yellow fever, filariasis, etc., is conveyed by an insect—a simulium, or sand-fly. It is owing to Dr. Sambon's untiring advocacy of this view and his examination of cases that the disease has now been recognized in England. The first case dates back only to October, 1912, but already other cases are being recorded in the medical journals, sometimes two or three in one number.

Unhealthy Offices for Clerks: Proposals for Betterment

The health officer for the City of London, Dr. Collingridge, states in his recent annual report that many clerks have to work in unhealthy surroundings, and that legislation is necessary for the improvement of the conditions of their employment. He refers to the Railway Offices Bill as a step in the right direction, but says that it is difficult to understand why provisions for efficient ventilation and adequate lighting should be restricted to railway offices. Two other bills dealing with the conditions of employment of all clerks have, however, been before Parliament for the last two sessions. One of them, the Factory and Workshops Bill, which was first introduced in the House of Lords by Lord Salisbury in 1912, proposes to bring underground workshops and offices under the jurisdiction of the Factories Acts, so that they may be inspected under the same terms and subject to the same penalties as large factories and workshops. This bill is supported by the National Federation of Shop-Workers and Clerks, which has a membership of 140,000. Last session it passed through all the stages in the House of Lords, but no progress could be made with it in the House of Commons owing to pressure of government business. The National Union of Clerks, while supporting Lord Salisbury's bill, has also had before Parliament for three years a measure of its own, the Offices Regulation Bill, which seeks to bring all persons employed as clerks in offices under the protection of the Factories Acts. It is stated that thousands of clerks are compelled to work not only in unhealthy underground offices but in offices just as insanitary which look out on courtyards. It is also stated that a factory inspector has frequently to pass through inadequately ventilated and lighted rooms, where clerks are employed, on his way to the workshop which he is to inspect, and yet he is powerless to call attention to the unhealthy condition of these premises. The mortality of clerks from diseases of the chest is twice as high as among the general population. Twenty-five per cent. of the deaths are due to consumption, and 33 per cent. to some form of lung disease. This excessive death-rate is ascribed partly to the sedentary nature of clerical employment, and partly to the dirt and dust, the cold in winter and the heat in summer, of the offices in which many ot these clerks have to work.

New Buildings of the London School of Tropical Medicine

As the result of the appeal of Mr. Austin Chamberlain, formerly Secretary for the Colonies, considerable additions have been made to the London School of Tropical Medicine. The funds have been partly subscribed by the public and partly granted by the government. Additional buildings have been erected, consisting of a laboratory providing accommodation for sixty students, and of a hostel with provision for twenty-five residents. The new laboratory has been built so as to be continuous with the old laboratory of the school. It is a square single-story building, lighted by a weaver-roof. The accommodation set free by it has rendered possible the formation of several special laboratories, of preparation rooms, of the director's room and of incubation rooms. The resident accommodation is intended for the use of students qualifying for appointments in connection with the Colonial Office, but it is expected to be sufficient to enable any of those attending the school, who desire, to reside on the spot. Each of the rooms is furnished as a bed-sitting room, and as a result of the extensions there is now considerably more space available for the common rooms connected with the school. In connection with the work of the school an important new departure has been made by the inauguration of a course in Tropical Sanitation and Hygiene, this step having been taken in consequence of a demand expressed from India and from most of the dominions. It is to consist of an eight weeks' course of laboratory studies and part health work, special attention being given to bacteriology and hygiene.

Impure Milk

The report just issued by Dr. Collingridge, health officer of the City of London, is not reassuring as to the quality of our milk-supply. From 1902 onward samples of the milk arriving at the railway termini have been systematically taken and submitted to bacteriologic examination by Dr. F. W. Andrews. He found that of these samples 20 per cent. were dirty, 46.6 per cent. were "fairly clean," and only 33.3 per cent. were describable as "clean." The tubercle bacillus was present in 6.6 per cent. of the cases. A study of the returns from 1904 to 1912 shows that the proportions between "fairly clean" and "unclean" have fluctuated very widely—in one year being as 80 to 12, and in a later year 28 to 71. In only one year were all samples examined found free from tubercle bacilli. These results indicate the prevalence of highly unsatisfactory conditions in the milk trade. Dr. Andrews says that until the hands of farmers, dairymen and others engaged in the distribution of this indispensable commodity are forced by statute no real or lasting improvement can be looked for. Indeed, it is evident that the inspection of dairies and cowsheds is not of itself enough, though even there much is to be done. The old pattern of churn in which the milk was sent by rail has been improved. The perforations that were provided in intention for ventilation, but in effect for the admission of dirt, have been done away with, and replaced by dust-proof cans; but that improvement must be neutralized as long as there is no guarantee that the touch of those engaged in the processes of dairying is free from contamination.

PARIS LETTER

(From Our Regular Correspondent)

Paris, Sept. 1, 1913.

Annual Meeting of French-Speaking Alienists and Neurologists

This congress was held at Le Puy, August 1 to 7, under the presidency of Dr. Arnaud of Vanves and the vice-presidency of *agrégé* Professor Dupré of Paris. Three questions were discussed: first, the disturbances of motion in dementia praecox; second, anesthesias in cerebral hemiplegia; third, the therapeutic and medicolegal indications for operation on the insane. Dr. Lucien Picqué, surgeon of the hospitals of Paris, read a paper on this subject, an interesting discussion following.

OPERATIVE INDICATIONS IN THE INSANE

Dr. Picqué remarked that half a century ago the action of surgery on mental disturbances was regarded from widely different points of view. Some operated directly on the brain or its envelopes, but their attempts are still too few and too uncertain to furnish the basis of a rational surgery. Other surgeons, and these are the more numerous, attempt to cure certain forms of insanity by the surgical treatment of pathologic foci situated outside of the brain. Numerous "cures" have been announced from such procedures. Picqué reports a total of 2,666 operations in his service at the Sainte-Anne asylum up to Jan. 1, 1913. This includes 314 organic psychoses and 383 congenital psychoses—altogether 697 patients —on whom he has performed operations of urgency. There remained 1,969 patients on whom surgery has given variable results. Picqué believes that at present it is necessary to beware of operative statistics based on doubtful facts, and in the first place to establish the rôle of extracerebral pathologic foci with respect to the origin of insanity; that is, to define the nature of the relations between an organic lesion and certain concomitant mental conditions. This problem is at the base of the question of operative indications in the insane. To-day the study of certain functions permits the definition of the rôle of organic lesions in the production of mental troubles, as in the case of the relation between the thyroid gland and certain forms of insanity. It has been known for a long time also that infections of the liver or the kidneys may give rise to mental troubles. The importance hitherto given to hereditary influences has waned without disappearing. A surgeon, on the one hand, should take heredity into consideration so that he may recognize patients whose mental condition constitutes a contra-indication to operation. On the other hand, the theory of the extracerebral origin of certain mental disturbances permits the surgeon to attack the latter in their peripheral foci. The coincidence of insanity and a peripheral lesion, however, does not imply a causal connection.

When the therapeutic indication has been established it is necessary to decide on the therapeutic method to be employed. Some cases of insanity may, after a perfectly justified operation, persist, become aggravated or be cured according to the method of treatment employed. The surgeon's method should be chosen with reference to the mental condition of the patient, and thus questions of surgical technic play an important rôle in psychiatry. Because of its difficulties surgery of the insane constitutes a special branch which Picqué calls "surgical psychotherapeutics." It calls for a long apprenticeship and, it is needless to say, for high moral qualities.

While the insane patient is considered to-day as a sick man who has the right to benefit by all the resources of medical and surgical therapeutics, the French law of 1838 contains nothing which authorizes the surgeon to give surgical relief to the insane as a matter of course. The request for authorization from the families of the insane gives rise to great abuse.

Dr. Lagriffe of Auxerre remarked that the surgery of the insane was beset with great difficulties, "the surgeon's knife often turning against himself." He cited the case of a patient who complained of various vague disturbances in the genital region, and who persuaded a skilful surgeon to operate on a by no means troublesome varicocele. The surgeon performed the operation, which was neither useful nor necessary, merely to satisfy the patient. The vague troubles did not cease. The patient pursued the surgeon first with complaints and then with reproaches and finally made an unsuccessful attempt to kill him.

Professors Régis of Bordeaux and Gilbert Ballet of Paris, with Drs. Dupré and Dide of Toulouse, united in depreciating the rôle of surgery in alleged cures of mental disease, which they were inclined to attribute to spontaneous recovery in most cases.

In his reply, Dr. Picqué, while agreeing with the criticisms made on the possible abuses of the surgery of the insane, remarked that these abuses could *not* be regarded as an argument against such surgery itself.

REVISION OF THE LAW WITH REGARD TO THE INSANE

On the motion of Prof. Gilbert Ballet, the congress unanimously protested against the proposed revision of the law of 1838, now before the senate (The Journal, May 31, 1913, p 1719), and especially against the clause requiring judicial procedure before patients are admitted to asylums or sanatoriums. If it is legitimate and desirable to require a judicial decision in the case of the criminal insane and those who formally protest against being placed in asylums, it would be useless and vexatious to impose such a requirement on other patients who constitute more than 80 per cent. and thus to transform asylums and sanatoriums into prisons, entered only after court procedure.

ORGANIZATION OF INTERNATIONAL CONGRESS OF NEUROLOGISTS, PSYCHIATRISTS AND PSYCHOLOGISTS

The congress passed a resolution looking toward the formation of an international committee to organize an international congress of neurologists, psychiatrists and psychologists.

BERLIN LETTER

(From Our Regular Correspondent)

Berlin, Aug. 29, 1913.

Personal

Professor Rieder Pasha died in Bonn, August 29, at the age of 51 years. In 1895 he was assistant to Schede of Bonn, the well-known surgeon, and in 1898 he was called to Turkey as the inspector of the Turkish Medical School for Army Physicians in order to organize this after the German method. He filled his position capably and an account of his work was published with the favorable comment of his early teacher. Schede later had a chance to show his great interest in his pupil. In 1905, Rieder, while going through a new building for the military medical school, which he founded, fell several stories and injured his spine so that it was feared that the injury might be fatal. Schede himself hastened at once to Constantinople and had the good fortune to save Rieder's life, but the latter remained a cripple. His usefulness for Turkey was naturally over and in 1905 he returned to Bonn. There he again took up his work as teacher in the university and became the director of the surgical section of the hospital. The various difficulties with which he had to struggle are described in his book on the work which he did in Turkey.

Professor Neuberg, who for many years has been assistant to Professor Salkowski, has been appointed a demonstrator in the chemistry division of the Kaiser Wilhelm Institute for Experimental Therapy in Dahlem, near Berlin, with the approval of the kaiser.

Women Students in the German Universities

In the twenty-one German universities during the last summer, out of a total number of 60,000 students, 3,436 were women, the highest number that the women students had attained up to this time. Counting such students as attended only a small number of semesters or only a few lectures and did not take the examinations, more than a thousand women attended. The number of women medical students was 790. Most of the women attended the Prussian schools, only 20 per cent. being in Berlin.

A Further Decrease in the Birth-Rate in Prussia

In the first quarter of 1913 the number of births in Prussia was 293,652, which shows a decrease as compared with the same quarter of 1912 of about 10,000, or 3.56 per cent. The country is more concerned in this decrease than the city, but at the same time there were more births in the country proportionately to the general population than in the cities. There were 25.32 births per thousand inhabitants in the cities, while in the country there were 31.4. The number of deaths also has decreased proportionately. There were 162,871 as against 175,818 in the previous year, a decrease of 12,974, or 7.4 per cent. There was thus an increase in the population of about 3,000 over the first quarter of 1912. Of great importance was the decrease in the death of infants, which dropped from 43,721 to 40,440. There were 5,000 less deaths due to contagious diseases than in the first quarter of 1912. As illustrative of the value of the struggle against tuberculosis, there was a decrease in the number of deaths from this disease of 1,700. The suicides increased heavily, from 1,760 to 1,989; also the murders, from 3,672 to 3,945. Marriages also increased. They reached a total of 64,284, that is, 1,500, or 2.61 per cent., more than in the previous year.

Completion of the Plans for Care of Pulmonary Diseases

Toward the completion of the proposed program for the care of pulmonary diseases in Germany, the German Central Committee for the Care of Tuberculosis has named a commission with an auxiliary under the direction of the directors of the Robert Koch Institute, Dr. Gaffky and the directors of the German national insurance body. They are to arrange for a closer union between the 1,500 various German institutions. For the same purpose the *Journal for the Care of the Tuberculous*, published under the direction of the general secretaries, Professor Nietner and Professor A. Kayserling, has arranged to issue 12,000 copies in which will be contained the various regulations of the organizations interested in the care of tuberculosis.

BUDAPEST LETTER

(From Our Occasional Correspondent)

Budapest, August 30, 1913.

Title for Court Physician

Dr. Kerzl, court physician, has had conferred on him the title of "Special Medical Privy Councilor" by His Majesty, Francis Joseph. This is the first time that this title has been conferred here on a medical man. The special appointment is largely due to the personal friendship which His Majesty bears toward his body physician. Among other things this is also shown by the implicit obedience with which the king follows the instructions of Dr. Kerzl. No matter what important meeting or function may be scheduled, if Kerzl advises His Majesty to remain indoors he always obeys, although it is generally known that it is most disagreeable to the king to remain indoors even for twenty-four hours.

Cholera in Hungary

What has been particularly dreaded by medical men of Hungary ever since the outbreak of the Balkan war has at last come to pass: Cholera has spread beyond the borders of the Balkan countries and sporadic cases have been brought into Hungary by soldiers retiring from the Bosnian service. Nominally since the occupation of Bosnia by Austria-Hungary, soldiers recruited in Bosnia are sent to serve in Austria-Hungarian regiments and reversedly Austro-Hungarian soldiers are sent down to Bosnia. This has been done from a strategic point of view. Since the first half of August Bosnian regiments have been kept in readiness and even reservists have been summoned in extremely large numbers. These reservists have been discharged from service in the last two weeks and although the strictest precautions were taken, yet they have brought cholera into Hungary. The number of cases reported as yet is only six or seven, and in view of the stringent regulations, which are observed not only by medical men but also by lay people in the reporting of cases, it is very probable that the spread of cholera will be checked. Soldiers coming back from Bosnia after a long and severe service, instead of being kept under observation for a few days at the Hungarian border, have escaped. To prevent this the minister of war has ordered that soldiers escaping medical observation will be regarded as deserters, the penalty for which is a punishment service of one or two years.

Marriages

Viola L. Pennypacker, M.D., Huntington, W. Va., and Mr. William H. Scanland, Jr., of Benton, La., at Jenkintown, Pa., June 26.

Harry Raymond Mutchler, M.D., Rockaway, N. J., to Miss Helen Alene Van Cleaf of Asbury Park, N. J., June 25.

Joseph Edward Brookshire, M.D., Nowata, Okla., to Miss Anna C. Steward of Glenwood Springs, Colo., August 23.

Rudolph F. Rohlfing, M.D., Colorado Springs, Colo., to Miss Cora Ethel Luke, at Sheridan, Wyo., August 14.

Alfred Stahl, M.D., Newark, N. J., to Miss Martha Lowe of Mendham, N. J., September 3.

John Munn Hanford, M.D., to Miss Gwendolen Smith, both of New York City, September 3.

J. B. Chaiken, M.D., to Miss Jeannette G. Kirkel, both of Philadelphia, September 7.

Edwin Stanley Cooke, M.D., to Miss Anna Barrett, both of Philadelphia, September 1.

Nazareth A. Jerijian, M.D., to Miss Semagule Doodakyan, both of Chicago, August 30.

George Ives, M.D., to Miss Vivian Loretta Trentle, both of St. Louis, August 18.

Ben Vaughan, M.D., to Miss Mamie Agnes Decker, both of Louisville, September 1.

Deaths

Theodore S. E. Schaepkens van Riempst, M.D. University of Ghent, Belgium, 1900; of New York City; a member of the Medical Society of the State of New York; for four years surgeon to the Red Star Line; a member of the staff of the Polyclinic Hospital and Demilt and Hudson Street dispensaries and later chief of clinic of the outpatient department of St. Luke's Hospital and lecturer in genito-urinary surgery at the Polyclinic Hospital; a member of the American Urological Association; was accidentally drowned in Saranac Lake while fishing, August 21.

John Milton Bigelow, M.D. College of Physicians and Surgeons, New York City, 1870; A.B., A.M. and Ph.D. (Hon.), Williams College; a fellow of the American Medical Association; professor emeritus of materia medica, therapeutics and diseases of the throat and nose in Albany (N. Y.) Medical College; at one time president of the Albany County Medical Society and honorary president of the Pan-American Medical Congress; attending physician at the Albany and St. Peter's Hospitals; died at his home in Albany, August 25, aged 67.

Sinkler Nicholas Latham, M.D. Birmingham (Ala.) Medical College, 1897; a fellow of the American Medical Association; formerly chief surgeon of the Sloss-Sheffield Steel and Iron Company; later chief surgeon of the Birmingham Coal and Iron Company at Mulga; division surgeon for the Southern Railway with headquarters at Birmingham; died in a sanatorium in Birmingham, August 31, from nephritis, aged 40.

Joseph Beggs Carter, M.D. Rush Medical College, 1882; a member of the Kansas Medical Society; for eighteen years a member of the Kansas State Board of Health and once chairman of the board; for several years physician of Fort Scott and Bourbon County, and local surgeon for the Frisco and Missouri Pacific Systems; died at his home in Fort Scott, September 2, from nephritis, aged 54.

Elisha Merritt Whitten, M.D. Medical School of Maine at Bowdoin College, Brunswick, 1865; twice president of the Nebraska State Medical Association and at one time professor of gynecology in the University of Nebraska Medical College; a practitioner of Nebraska City for 48 years; died at his home, September 4, from disease of the heart and kidneys, aged 76.

Thomas Edward Pickett, M.D. University of Pennsylvania, 1865; a fellow of the American Medical Association; surgeon in the Army throughout the Civil War; a member of the American Academy of Medicine and a life member of the British Association for the Advancement of Science; died at his home in Maysville, Ky., September 3, from senile debility, aged 72.

Walter E. Russell, M.D. Hahnemann Medical College, Chicago, 1889; a fellow of the American Medical Association; for several terms city health officer and a member of the School Board of Walla Walla; who underwent operation a few weeks ago on account of malignant disease; died at his home in Walla Walla, August 28, from carcinoma, aged 55.

Frank J. Wagenseller, M.D. University of Pennsylvania, Philadelphia, 1878; a member of the Medical Society of the State of Pennsylvania; county inspector for Snyder County for the State Board of Health; a practitioner of Selinsgrove, Pa.; died in the Samaritan Hospital, September 5, from uremia, two weeks after a surgical operation, aged 57.

Edwin Rushton Boden, M.D. Long Island College Hospital, Brooklyn, 1880; at one time a member of the common council of Oneida, N. Y.; for fourteen years deputy collector or cashier in the Internal Revenue Service; died at his home in Oneida, August 16, from cerebral hemorrhage, aged 54.

Howard Smith, M.D. University of Pennsylvania, 1871; surgeon, lieutenant, U. S. Navy, retired in 1890 for incapacity resulting from incident of service; assigned to active duty during the war with Spain; died in the Naval Hospital, Norfolk, Va., September 4, aged 65.

Theophilus H. Andress, M.D. College of Physicians and Surgeons, New York City, 1864; a veteran of the Civil War, in which he served as a medical cadet; a practitioner of Sparta, N. J., for nearly half a century; died at his home, August 26, aged 72.

Henry M. Emerick, M.D. College of Physicians and Surgeons, Baltimore, 1880; a member of the Medical Society of the State of Pennsylvania; died at his home in Milton, August 31, from acute indigestion, aged 59.

John Lochner, M.D. New York University, New York City, 1871; for nineteen years a member of the Jersey City Board of Health; for twenty years medical examiner for the Jersey City Fire Department, and for seventeen years city physician; consulting physician to the Home for the Homeless; died at his home in Jersey City, September 3, aged 68.

Samuel Rozier Catts, M.D. Baltimore Medical College, 1906; a fellow of the American Medical Association; for several years a member of the Medical Corps of the Army, and at one time on duty at the National Soldiers' Home, Hampton, Va.; died at the home of his father in Alexandria, Va., August 29, from tuberculosis, aged 36.

Charles W. Maddox, M.D. Louisville (Ky.) Medical College, 1894; a fellow of the American Medical Association; local surgeon in Longton, Kan., for the Santa Fe System; a member of the Atchison, Topeka & Santa Fe Railway Association of Physicians and Surgeons; died at his home in Longton, August 20, aged 41.

Ellwood Maulsby Corson, M.D. University of Pennsylvania, Philadelphia, 1863; a fellow of the American Medical Association; acting assistant surgeon and assistant surgeon in the Navy during the Civil War; for more than 40 years a practitioner of Norristown, Pa.; died at his home, about September 7, aged 71.

George Angel Edwards, M.D. College of Physicians and Surgeons, New York City, 1877; a fellow of the American Medical Association and a well-known gynecologist of Syracuse, N. Y.; died in St. Joseph's Hospital, September 3, a day after a surgical operation, aged 68.

Philander Sumner Boyd, M.D. University of Tennessee, Nashville, 1888; a member of the Medical Association of the State of Alabama, and for about twenty years a practitioner of Florence; died in New York City, August 30, from disease of the stomach, aged 63.

John Thomas Broughton, M.D. University of Pennsylvania, Philadelphia, 1853; a member of the Medical Association of the State of Alabama and a pioneer practitioner of Butler County; died at his home in Greenville, August 29, from heart disease, aged 83.

George Y. Pierce, M.D. Southern Medical College, Atlanta, 1890; for several terms a member of the Common Council and a member of the Board of Education of Atlanta, and at one time a member of the Board of Health; died at his home, August 25, aged 49.

Charles Edward Keeler, M.D. College of Physicians and Surgeons, Keokuk, Iowa, 1879; local surgeon at Lake Mills, Iowa, for the Chicago and North-Western Railway and health officer of Lake Mills; died at his home, August 23, from tuberculosis, aged 59.

Charles Herman Reinsberg, M.D. College of Physicians and Surgeons, New York City, 1900; a graduate both in theology and medicine and a clergyman of the Protestant Episcopal Church; died at his home in New York City, August 27, aged 46.

William H. Busch, M.D. Northwestern Ohio Medical College, Toledo, 1888; for several years infirmary physician of Erie County, Ohio, and later county health officer; died at his home in Sandusky, August 22, from malignant disease, aged 49.

Allison Emery Drake, M.D. University of Denver (Colo.), 1901; at one time professor of foreign languages in Westminster University; for sixteen years a resident of Denver; died in Park Avenue Hospital in that city, August 28, aged 53.

John P. Pardue, M.D. Missouri Medical College, St. Louis, 1880; formerly professor of materia medica and hygiene in the St. Louis College of Physicians and Surgeons; died at his home in St. Louis, August 29, from nephritis, aged 61.

Alexander M. Troup, M.D. University of Buffalo, N. Y., 1900; while answering a sick call a few miles from his home in Holland, N. Y., August 24, was pinned under the seat of his overturned automobile and instantly killed, aged 35.

George T. Wrennick (license, Indiana); for nearly fifty years a practitioner of the state, Philadelphia; a veteran of the Civil War; died at the home of his son in Brazil, August 29.

Henry Janss, M.D. Kentucky School of Medicine, Louisville, 1893; died at his home in Springfield, Mo., August 31, from cerebral hemorrhage, following heat prostration, aged 52.

N. S. Grice (license, Twentieth Judicial District Board, Texas, 1891); died suddenly at his home in Bryan, August 6, from heart disease, aged 58.

Henry Cushman Turner, M.D. New York University, New York City, 1867; of Brooklyn, consulting physician to the Norwegian Hospital; died at the home of his brother in Washington, Conn., August 16, from nephritis, aged 68.

Charles P. Spottswood, M.D. Minnesota Hospital Medical College, Minneapolis, 1888; founder and surgeon-in-chief of the Hankinson (N. Dak.) Hospital and local surgeon of the Soo Line; died in Minneapolis, August 11, aged 49.

George W. Walworth, M.D. Starling Medical College, Columbus, Ohio, 1891; a member of the Michigan State Medical Society; of Reese; who had gone to Rochester, Minn., for a surgical operation; died recently from pneumonia.

Arba Reed Green, M.D. New York Homeopathic Medical College, 1880; pediatrist to the Albany Homeopathic Hospital; from 1871 to 1881 coroner of Rensselaer County, N. Y.; died at his home in Troy, September 1, aged 59.

Harry Murrell Carter, Jr., M.D. Tulane University, New Orleans, 1911; superintendent and proprietor of the Carter Sanatorium, Tucson, Ariz.; died at his home in that city, August 28, from tuberculosis, aged 23.

James Edward M. Lordly, M.D. College of Physicians and Surgeons, New York City, 1868; of New York City; president of the St. George Club of New York; died at his summer home in Chester, N. S., August 21, aged 68 .

Bernard W. Slagle, M.D. University of Pennsylvania, Philadelphia, 1877; of Smith Center, Kan.; while waiting at a station to take a train for Colorado, about August 24, died suddenly from cerebral hemorrhage.

Daniel Aloysius Shay, M.D. Baltimore University, 1901; New York University, New York City, 1904; a practitioner of Brooklyn for ten years; died in Marlborough, N. Y., August 21, from acute nephritis, aged 37.

Frederick Stanton McKinney, M.D. Marion-Sims College of Medicine, St. Louis, 1898; formerly of Leetonia, Ohio, but for a few months a resident of St. Louis; died suddenly in Leetonia, August 19, aged 41.

Margaret S. McNiff, M.D. Hahnemann Medical College, Chicago, 1893; formerly professor of obstetrics in Hering Medical College; died at her home in Chicago, August 21, from heart disease, aged 63.

Theodore Robert Miller, M.D. New York University, New York City, 1886; for seven years chief physician to the City Home, Marshalsea; died at his home in Pittsburgh, September 1, aged 53.

R. Wallace Salisbury, M.D. Chicago Homeopathic Medical College, 1886; formerly a member of the Iowa State Medical Society; died at his home in Estherville, about August 14, aged 53.

Jacob Derx, M.D. State University of Iowa, College of Homeopathic Medicine, Iowa City, 1887; of Kansas City, Mo.; died in Bethany Hospital, Kansas City, Kan., August 8, aged 74.

Elias L. Dagley, M.D. University of Louisville, Ky., 1887; for eighteen years a resident of Oklahoma; died in his apartment in Oklahoma City, August 17, from heart disease, aged 69.

Lucien Fletcher Webb, M.D. Detroit Homeopathic College, 1904; a member of the staff of Grace Hospital, Detroit; died at his home, September 3, from typhoid fever, aged 35.

Charles Patten Clark, M.D. University of Toronto, Ont., 1889; of Buffalo; died suddenly from heart disease while driving his automobile in Buffalo, August 28, aged 49.

Annette H. Waggoner, M.D. University of Iowa, College of Homeopathic Medicine, Iowa City, 1882; of Kansas City, Mo.; died in a hospital in Colorado Springs, Colo., August 7.

Daniel H. Artherholt (license, Ohio, years of practice, 1896), for 49 years a practitioner of Ohio; died at his home in Youngstown, August 27, from heart disease, aged 75.

James Porter Williams, M.D. University College of Medicine, Richmond, 1897; of Richmond; died in the Catawba Sanatorium, August 20, from tuberculosis, aged 40.

Philip S. Fisher, M.D. University of Pennsylvania, Philadelphia, 1868; coroner of Center County; died at his home in Zion, Pa., August 19, from nephritis, aged 68.

Carl P. Friese, (license, Illinois, years of practice) for 48 years a practitioner of Chicago; died at his home, August 28, from cerebral hemorrhage, aged 80.

Orlando Ilstrup, M.D. University of Minnesota, Minneapolis, 1899; died suddenly at his home in Cokato, Minn.; August 12, from heart disease, aged 41.

The Propaganda for Reform

In This Department Appear Reports of the Council on Pharmacy and Chemistry and of the Association Laboratory, Together with Other Matter Tending to Aid Intelligent Prescribing and to Oppose Medical Fraud on the Public and on the Profession

CALOX

A Tooth Powder that Qualifies as a Nostrum

"Calox, the Oxygen Tooth Powder," is advertised as possessing "germicidal powers" which make it "the only dentifrice that will actually sterilize the oral cavity."

McKesson and Robbins, the makers, at one time made the claim that Calox gave up free oxygen from the calcium dioxid which the powder contained. In detail, the firm's claims were:

> "The basis of the preparation is a carefully selected variety of English Precipitated chalk, rendered slightly saponaceous and delicately flavored and to which is added in proper quantity calcium dioxid. It is this latter ingredient which confers upon CALOX its peculiar cleansing and germicidal properties. Calcium dioxid, like hydrogen dioxid, has the property of giving up oxygen in the nascent state when brought into contact with water or dead organic matter, at the same time forming milk of lime; it is therefore a powerful oxidizing agent, germicidal and antacid."

These claims were *misleading*, if not actually false. Calcium dioxid is practically insoluble in water and it is only that fraction which dissolves in water that gives up available oxygen. As, even according to the manufacturer's own claims, there was only 2 per cent. calcium dioxid in Calox and as only a minute fraction of that 2 per cent. is soluble, the oxidizing and germicidal powers of Calox must have been practically *nil*.

The claim has further been made that "Calox represents in powder form the therapeutic efficiency of a 2 per cent. hydrogen dioxid solution." A specimen of Calox was purchased in the open market and examined by the Association's chemists. It was found that the powder consisted largely of chalk, a small amount of soap and sugar with some oxygen-yielding substance and the whole flavored with wintergreen. Quantitative determination of the available oxygen showed that Calox contained an amount of oxygen equivalent to 0.8 per cent. hydrogen dioxid instead of the 2 per cent. claimed. In other words, the claim made for Calox was 60 per cent. false. More recently the company admits that its product contains the equivalent of only 1.5 per cent. hydrogen dioxid.

The entire available oxygen-content of Calox was found to be in its water-soluble part. As calcium dioxid is practically insoluble in water, it is evident that the oxygen in Calox is not derived from that drug as has been claimed. As a matter of fact, further examination showed that the essential oxygen-producing constituent of Calox is not calcium dioxid at all but from its properties appeared to be sodium perborate.

In this connection, some quotations from two patent specifications of dentifrices will be of interest. The first is from a patent issued May 17, 1904, to Edward C. Kirk who assigned one-half of the patent to one E. H. Gane and one other person:

> "The invention therefore consists in combining with any of the usual well-known or suitable tooth-powder materials. . . . *one of the dioxids* of the alkaline earth metals. . . ."
>
> "I have ascertained that about 2 per cent. of *calcium dioxid* is sufficient to accomplish the detergent and germicidal ends above described." [Italics ours.—Ed.]

Compare the foregoing with the following taken from a patent specification issued Oct. 17, 1905, to E. H. Gane, who assigned the patent to the exploiters of Calox, McKesson and Robbins:

> "The invention therefore consists in combining with any *of the* usual well-known or suitable tooth-powder materials. . . . *one of the* percarbonates or *perborates* of the alkali or alkaline earth metals. . . ."
>
> "I have ascertained that about 1 per cent. of percarbonate or *perborate* of the alkali or alkaline earth metals is sufficient to accomplish the detergent and germicidal ends above described." [Italics ours.—Ed.]

From the foregoing and from the further fact that the name "Calox" suggests "calcium dioxid," it is evident that Calox belongs in that class of nostrums the composition of which is changed from time to time while the name remains the same.

The later "literature" on Calox dodges the direct statement previously made that the preparation contains calcium dioxid. After stating that Calox contains chalk and castile soap with flavoring, we now read: "and to it is added the oxygen compounds, which form hydrogen dioxid when mixed with water." Nor is this all. The later advertising contains this statement:

> "Some manufacturers are offering to the *profession* 'peroxid powders' or 'peroxid pastes,' which contain metallic peroxids, but which do not contain *available oxygen*, that is, the peroxids are stable and not dissociated when mixed with water."

In other words, McKesson and Robbins charge "some manufacturers" with doing, to-day, just what McKesson and Robbins themselves did at one time.

The patents held by McKesson and Robbins give this firm the exclusive right of manufacturing tooth powders containing peroxids, perborates or percarbonates. It is another illustration of the unfair monopolies that may be secured under our present patent laws.

NATURAL AND SYNTHETIC SALICYLATES

Report of the Council on Pharmacy and Chemistry

With the view of determining the claimed superiority of "natural" salicylic acid and salicylates over the "synthetic" varieties, a practical study of the question was made under the auspices of the Committee on Therapeutic Research of the Council on Pharmacy and Chemistry. The investigations having been completed, the Council adopted the following report and authorized its publication.

W. A. PUCKNER, Secretary.

It has often been stated in medical papers, and particularly in the advertisements of manufacturers, that salicylates prepared synthetically are less effective than those prepared from the oils of wintergreen or birch, the so-called "natural" products, and that synthetic sodium salicylate is much more dangerous. These contentions, if true, should abolish the use of the synthetic products. If, on the other hand, these contentions are unfounded, there exists no good reason for the use of the much more expensive "natural" products.

To settle this question, the Committee on Therapeutic Research of the Council caused a series of investigations to be made. These showed conclusively that:

1. Contrary to certain statements in the older literature, there is no difference in the toxic dose for animals between "natural" sodium salicylate, the most highly purified synthetic, and the cheapest commercial sodium salicylate now found on the market.[1]

2. The evidence for the claimed clinical differences, as found in medical literature, is extremely unsatisfactory and inconclusive.[2]

3. No significant chemical impurities are present in commercial synthetic salicylate.[3]

4. No difference can be detected clinically, either in the therapeutic or toxic effects, if the comparison is made under conditions which strictly exclude personal bias.[4]

The Council therefore concludes that there is no difference in the actions of "natural" and synthetic salicylates, and that statements that differences exist are unfounded.

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[1] Waddell, J. A.: A Comparative Investigation of the Effects and Toxicity of Sodium Salicylates of Natural and Synthetic Origin, Arch. Int. Med., December, 1911, p. 784.

[2] Eggleston, C.: The Relative Value of the "Natural" and the Synthetic Salicylates, THE JOURNAL A. M. A., Dec. 7, 1912, p. 2057.

[3] Hilpert, W. S.: The Purity of Commercial Sodium Salicylate, THE JOURNAL A. M. A., April 12, 1913, p. 1137.

[4] Hewlett, A. W.: Clinical Effects of "Natural" and "Synthetic" Sodium Salicylate, THE JOURNAL A. M. A., Aug. 2, 1913, p. 319.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and *queries on* postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

ANOTHER CONSUMPTION VACCINE

To the Editor:—I have before me the *Bacterial Therapist*, G. H. Sherman, M.D., Editor, Detroit. He has an editorial on the "Non-Virulent Tubercle Bacillus Vaccine," and reports some wonderful (?) results from it. Please inform me if there is anything to this vaccine, or is this the result of our imported friend Friedmann? C. N. CHIPMAN, M.D., Washington, D. C.

ANSWER.—This "Non-Virulent Tubercle Bacillus Vaccine" has the appearance of being simply another nostrum of the vaccine and serum variety. We have nothing but the word of the promoters regarding not only what it is, but also what it is good for. This fact alone should be sufficient to warrant throwing into the waste-basket "literature" of the kind referred to by our correspondent and published in the house organ of the firm. The reader is led to believe without specifically being told so that this vaccine is the same as, or a modification of, the notorious Friedmann preparation. Thus we are told, "It is claimed that a culture of this tubercle bacillus was originally obtained from a turtle that had tuberculosis . . . " Friedmann's "discovery" being thus hinted at, the Friedmannian source of this active-harmless preparation is stated—still somewhat guardedly—to be " . . . a culture of which bacilli was obtained last March at a hospital in New York City, where the living organism was first administered in this country . . ." How this organism was obtained we are not informed. We do not know whether it came from the original culture or from a patient. If from the latter, nothing is said as to whether it was a direct descendant of the turtle bacillus or one of the patient's organisms, modified by the treatment or otherwise. According to the promoters, the organism proposed as a remedy has been rendered non-virulent by killing it and converting it into a vaccine. So far as we can learn, therefore, the "Non-Virulent Tubercle Bacillus Vaccine" is an attenuation of Friedmann's tubercle bacillus. The experimental and other data offered have the appearance of the "made to order" kind. As we have already stated, the tone of the advertising "literature" discredits it at the outset and its doubtful parentage cannot beget much confidence in its future. There is no reason to expect more of this preparation—agreeing that it is what its promoters think it is—than of the tuberculins already well known. It is to be hoped that physicians will bear in mind recent fiascos in the line of prematurely announced consumption cures and give this Friedmann shadow a wide berth. While there is reason to hope that, if worthless, it may also prove harmless, the present insufficient data are no reason for the abandonment of the present methods.

We presume that this, like so many similar products of questionable value, will be manufactured under a "government license." It is to be hoped that the day is not far distant when Congress will give the Public Health Service authority to withhold a license for preparations of this character; such authority has been conferred on the secretary of agriculture, who can prohibit the interstate shipment of worthless serums, vaccines, etc., which are to be used in the treatment of diseases of animals. Apparently, however, the Public Health Service is forced to grant a license for almost anything provided it is made in a fairly cleanly manner and is put on the market in a sterile form.

TRACHOMA REGULATIONS IN THE DIFFERENT STATES

To the Editor:—As secretary of the Insular Board of Health of Porto Rico, I am interested in knowing which states of the Union have enacted acts regulating the prevention of trachoma. We are anxious to have the data in order to establish an efficient method to prevent trachoma. Our purpose is to know the name of the states, in order to obtain the rules and regulations concerning trachoma. JOSÉ LUGO-VIRTA, San Juan, P. R.

ANSWER.—In those states which have specifically regulated "trachoma," two methods seem to have been adopted. Either the health authorities are vested with power by the state legislature to declare diseases infectious and the like and to require that such diseases be reported, or the state board drafts certain necessary regulations which are subsequently adopted by the state in a legislative enactment. In either case such rules have the force of, or are made, the law of the state.

In Massachusetts, by ruling of the State Board of Health, trachoma was made reportable May 6, 1909; while by Chapter 75, Massachusetts Revised Laws, Section 50, all the physicians of that state must report infectious diseases and the like which come to their attention to the health authorities.

Pennsylvania by Public Laws 1909, p. 855, Section 1, requires physicians to report trachoma either to a local health officer or to the State Department of Health. Osteopaths are likewise required to report these diseases. The state commissioner of health has power to issue any further necessary regulations.

The Texas Sanitary Code was enacted into law, March 3, 1911. All persons infected with trachoma are to be excluded from schools and any similar public place in which persons may congregate unless by a physician's certificate there is sufficient warrant that all dangerous inflammation has disappeared.

The Washington State Board of Health is vested with power to declare a disease infectious and the like. Trachoma is reportable and physicians must, in writing within twenty-four hours, notify the nearest health officer of all such infections.

By Act 125, Laws of Hawaii, 1911, Section 3, trachoma was declared to be infectious, and by Revised Laws, Section 1004, all physicians are required to report the disease to a proper health authority.

A large number of the states have not legislated specifically on this subject. But such jurisdictions have apparently contented themselves with vesting their health authorities with power to take all needful precautions in regard to any dangerous diseases and the like. In a few states, under laws providing for the physical inspection of schoolchildren, parents and guardians are required to furnish proper care in a case in which a child's eyes may become infected or the like, as in Connecticut, Chapter 104, Act 1899, and Chapter 40, Act 1901. In the Sanitary Code of 1911, Louisiana furnishes a good example of vesting the State Board of Health with the necessary power to declare a given disease infectious and the like.

BINET TEST—SUBCUTANEOUS ADMINISTRATION—"INFANTILE PARALYSIS"—RUSSIAN OIL

To the Editor:—Please answer the following:

1. Where can I find the Binet tests for defective children, as modified by Dr. Goddard?

2. What, if any, are the advantages of the subcutaneous method of administering iron, arsenic and strychnin by ampules over other methods of administering these remedies?

3. Is it correct to speak of an adult as suffering from a recent case of "infantile paralysis"?

4. Is there an oil with "Russian-sounding name" now prescribed by best New York physicians "for chronic constipation"? This is the indefinite statement of a recent patient, who seems surprised that I cannot at once state the name of the remedy.

J. E. Heath, Gardiner, Me.

Answer.—1. This method is described in "Modern Treatment of Nervous and Mental Diseases," by White and Jelliffe, Vol. I, p. 158 (Philadelphia, Lea and Febiger, 1913).

2. The subcutaneous method avoids irritation of the stomach or intestines. It may secure more certain absorption. Usually, however, the ordinary method of administration secures the desired results.

3. The disease commonly called "infantile paralysis" has been designated as "acute anterior poliomyelitis." Recent investigations show that the lesions are more extensive than formerly supposed and not confined to the anterior gray matter of the cord. Hence the term "anterior poliomyelitis" becomes inappropriate as it does not cover all cases of the disease. While it seems somewhat absurd, it may, however, be excusable to speak of an adult as suffering from an attack of "infantile paralysis."

4. The oil referred to is probably a proprietary preparation of a paraffin oil. So far as we know, paraffin oil is coming into use in cases of chronic constipation, but we are not sure that Russian oil is now prescribed by the best New York physicians. Liquid petrolatum will serve the same purpose in treating constipation.

SUITABLE METHODS OF ADMINISTERING DRUGS—PALATABLE SOLUTIONS OF VERONAL

To the Editor:—Will you favor me with formulas for making palatable solutions of veronal? C. O. M., Boston.

Answer.—The most palatable solutions of veronal are those obtained by dissolving the dose to be administered in a glass of warm milk or in water, as warm as can be drunk, flavored with a little lemon juice. If the patient objects to taking hot drinks, veronal, which requires 150 parts of cold water for solution, may be replaced by the sodium salt of veronal (sodium diethyl-barbiturate) which is soluble in five parts of water at ordinary temperature. This soluble salt of veronal is marketed as veronal-sodium and medinal (see N. N. R., 1913, p. 78). As veronal-sodium has a bitter, alkaline taste it is best given largely diluted with water. Elixirs of veronal and of veronal-sodium may be prepared, but in general the sweet taste accentuates the taste of veronal. These elixirs are also objectionable because of their alcohol content.

To the Editor:—Have you any publications useful for the doctor who dispenses, which will aid him in preparing and dispensing palatable mixtures? Kindly inform me of any such publications and the price. F. J. Dodd, M.D., Pembroke, Ontario.

Answer.—The following publications contain much information of value to physicians both as to the writing of prescriptions and their compounding:

Beal, J. H.: Prescription Practice and General Dispensing, An Elementary Treatise for Students of Pharmacy, published by the author, Scio, Ohio, 1907.

Fantus, Bernard: A Text-Book on Prescription-Writing and Pharmacy with Practice in Prescription-Writing, Laboratory Exercises in Pharmacy and a Reference List of the Official Drugs, Especially Designed for Medical Students, Chicago Medical Book Company, 1906.

Physicians should have little difficulty in preparing drugs for administration if they will take the trouble to learn the properties—taste, solubility, chemical incompatibilities, etc.—of the remedies which they use and if they will avoid complex mixtures. Thus an understanding of the physical properties of veronal (see preceding inquiry) will readily suggest suitable methods of administration.

TREATMENT OF CONSUMPTION BY WORK AND EXERCISE

To the Editor:—What articles covering work and exercise in the treatment of consumption have appeared recently? M. D. S.

Answer.—The following articles have reference to treatment of consumption by work and exercise:

Flinn, J. W.: Rest and Repair in Pulmonary Tuberculosis, The Journal, Aug. 16, 1913, p. 466.

Teleky, L.: Choice of Occupation with Regard to Tuberculosis, *Wien. klin. Wchnschr.*, March 13, 1913; abstr., The Journal, April 26, 1913, p. 1336.

Halcomb, S. R. C.: Graduated Labor in Pulmonary Tuberculosis, *Military Surgeon*, February, 1913; abstr., The Journal, Oct. 26, 1912, p. 1564.

Allan, J. W.: Graduated Labor at Bellefield Sanatorium, *Glasgow Med. Jour.*, January, 1911; abstr., The Journal, Feb. 4, 1911, p. 384.

Francini, A. P.: Rest, Exercise and Food in the Management of Tuberculosis, *New York Med. Jour.*, Dec. 31, 1910; abstr., The Journal, Oct. 29, 1910.

Paterson, M.: Treatment of Pulmonary Tuberculosis by Graduated Rest and Exercise, *Practitioner*, January, 1913.

MacCorison, C. C., and Burns, N. B.: Method of Recording Exercise Data in Sanatorium for Consumptives, *Boston Med. and Surg. Jour.*, May 9, 1912.

EFFECT OF EUCAIN

To the Editor:—It is stated by P. LeMee (*Ann. d. mal. de l'oreille, du larynx, etc.*, Nov. 9, 1912) that beta-eucain is a vasodilator. The "American Text-Book of Surgery," 1899, p. 1103, states that "from a clinical point of view, eucain produces just as rapid, profound and lasting anesthesia as cocain, but is less dangerous. Occasionally, however, local gangrene as a result of vasomotor constriction has been observed."

Please advise me which is correct.

P. O. Chaudron, M.D., Dothan, Ala.

Answer.—Pharmacologists agree in stating that eucain does not constrict the blood-vessels. Hyperemia is produced rather than anemia.

EFFECT OF ALTITUDE ON BLOOD-PRESSURE

To the Editor:—In the Queries and Minor Notes column of The Journal (Sept. 6, 1913, p. 787) you refer to blood-pressure and the effect of altitude. For six years past we have been studying the effect of altitude on blood-pressure in consumptives at an elevation of 6,000 feet. Our first report was published in the *Archives of Internal Medicine*, August, 1908. This report covered but one hundred cases, but our findings in six hundred cases were reported before the American Medical Association at Minneapolis this year. This article will be published in the *Archives of Internal Medicine* in the near future. We think we have shown conclusively that altitude tends to raise blood-pressure rather than lower it, both in consumptives and in normal persons living at high altitudes. The fact that our studies cover six hundred cases seems to us to offset any former observations, such as Gardner and Hoaglund's, which took into consideration so few patients that the facts can be of little scientific value compared to a larger study.

We at least feel that in referring to blood-pressure work and altitude our findings deserve as much consideration as the references to which you refer.

L. S. Peters, M.D., Silver City, N. Mex.

Medical Economics

THIS DEPARTMENT EMBODIES THE SUBJECTS OF POST-GRADUATE WORK, CONTRACT PRACTICE, LEGISLATION, MEDICAL DEFENSE, AND OTHER MEDICOLEGAL AND ECONOMIC QUESTIONS OF INTEREST TO PHYSICIANS

The Present Legal Status of Osteopathy

Frequent inquiries are received regarding the present laws regulating osteopathy in different states. The study of the efforts made at regulation of this cult by the different state legislatures is most interesting. Early in its development its adherents began agitation for separate boards of examination and license. In nineteen states such laws have been enacted. In others, some kind of compromise or half-measure has been adopted.

Those states now having separate osteopathic boards of examiners, with the date of passage of the present law are:

Arkansas	1903	Montana	1905
Connecticut	1901	Nebraska	1909
Florida	1909	New Mexico	1905
Georgia	1909	New Hampshire	1911
Idaho	1907	North Dakota	1909
Kansas	1913	Pennsylvania	1911
Louisiana	1908	South Dakota	1907
Michigan	1903	Tennessee	1905
Minnesota	1903	Vermont	1909
Missouri	1907		

In twelve states amendments to the medical practice act have been adopted, providing for the appointment of one or more osteopaths on the examining board. These states are:

Arizona	1913	Oklahoma	1907
Indiana	1905	Oregon	1907
Iowa	1902	Texas	1907
Kentucky	1904	Utah	1907
Massachusetts	1911	Washington	1909
New York	1907	Wisconsin	1903

Ten states have enacted laws permitting the state board of medical examiners to examine and license osteopaths either as such or as practitioners of medicine:

California	1913	Ohio	1906
Colorado	1910	South Carolina	1904
Delaware	1907	Virginia	1911
New Jersey	1910	West Virginia	1907
North Carolina	1909	Wyoming	1905

In Illinois, the act of 1911 permits the State Board of Health to examine and license osteopaths at their discretion, but those so licensed cannot use medicine internally or externally, or perform surgical operations. By the revised laws of Maryland for 1902, "masseurs or other manual manipulators who use no other means" are exempted therefrom. This language would seem to apply to osteopaths.

To-day there are but five states in which no legislative steps have been taken to regulate the osteopaths as such:

Alabama
Maine
Mississippi
Nevada
Rhode Island

Is Osteopathy the Practice of Medicine?

In fifteen states either by judicial interpretation or by statutory enactment, osteopathy is included within the meaning of the term "practice of medicine." These states are: Alabama, California, District of Columbia, Illinois, Iowa, Nebraska, New York, New Hampshire, Nevada, Ohio, Texas, Utah, Virginia, West Virginia, Wyoming. In thirty-two states osteopathy is not the practice of medicine. These are: Arkansas, Arizona, Colorado, Connecticut, Delaware, Florida, Georgia, Idaho, Indiana, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, New Jersey, New Mexico, North Carolina, North Dakota, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Washington, Wisconsin. In one state, Maine, it seems that the question has never arisen for judicial interpretation, so that the present status of osteopathy there remains uncertain.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ARIZONA: Phoenix, October 7-8. Sec., Dr. John Wix Thomas, Phoenix.

COLORADO: State Capitol, Denver, October 7. Sec., Dr. David A. Strickler, 612 Empire Building.

GEORGIA: Regular, State Capitol, [illegible] Sec. Dr. C. T. Nolan, Marietta; Homeopath [illegible] 1. Sec., Dr. R. E. Hinman, 106½ Whitehall St.; Eclectic, State Capitol, Atlanta, October 14. Sec., Dr. C. W. Miller, 192 W. North Ave.

IDAHO: Boise, October 7. Sec., Dr. John F. Schmershall, Jerome.

ILLINOIS: Coliseum Annex, Chicago, September 24-26. Acting Sec., Amos Sawyer, Springfield.

KANSAS: National Hotel, Topeka, October 14. Sec., Dr. H. A. Dykes, Lebanon.

LOUISIANA: New Orleans, October 27-29. Sec., Dr. A. B. Brown, 34 Cusachs Building.

MICHIGAN: Capitol Bldg., Lansing, October 14-16. Sec., Dr. B. D. Harison, 504 Washington Arcade, Detroit.

MINNESOTA: University of Minnesota, Minneapolis, October 7-10. Sec., Dr. Thomas S. McDavitt, 814 Lowry Building, St. Paul.

MISSISSIPPI: Jackson, October 28-29. Sec., Dr. E. H. Galloway, Jackson.

MONTANA: State Capitol, Helena, October 7. Sec., Dr. Wm. C. Riddell, Helena.

NEW JERSEY: State House, Trenton, October 21-22. Sec., Dr. H. G. Norton, 429 E. State Street.

NEW MEXICO: Santa Fe, October 13. Sec., Dr. W. E. Kaser, East Las Vegas.

NEW YORK: September 23-26. Chief of Examinations Division, Mr. Harlan H. Horner, Department of Education, Albany.

OKLAHOMA: Muskogee, October 14. Sec., Dr. John W. Duke, Guthrie.

RHODE ISLAND: State House, Providence, October 2-3. Sec., Dr. Gardner T. Swarts.

UTAH: Salt Lake City, October 6-7. Sec., Dr. G. F. Harding, 310 Templeton Building.

WYOMING: State House, Cheyenne, October 15. Sec., Dr. J. B. Tyrrell, Laramie.

Additional Data for, and Corrections of, the Educational Number

The following additions and corrections should be made to the data published in the latest educational number of THE JOURNAL, that of Aug. 23, 1913:

In Table 1, on page 591, the fees charged by the University of Oklahoma School of Medicine for the four years, respectively, should have been $50, $29, $10 and $15. A letter from an officer of the school named states that these are laboratory fees and deposits, no tuition fees being charged.

Also in Table 1, on page 591, in line 45, for the University of Maryland School of Medicine, instead of three graduates having degrees from the college of liberal arts, there were five graduates having such degrees.

On page 582, in accordance with an official statement from the Missouri State Board of Health, the Hippocratean College of Medicine was marked by an asterisk (*), indicating that the school, during its existence, was "not in good standing with the home state licensing board." A letter just received from the secretary of the Missouri State Board informs us that at the time the school merged with the Barnes Medical College of St. Louis, now the American Medical College, a ruling was adopted by which two years' credit might be allowed for the completion of three years' work at the Hippocratean College of Medicine, or one year's credit might be allowed for two courses completed in that school, but that no credit could be given for the completion of one year's work.

In Table 2, on page 594, the second line 91 should have been line 92, Jefferson Medical College, Philadelphia; the figures in the balance of the line are correct.

On page 587, second column, Temple University, Department of Medicine, was included among medical colleges which were to require a year of college work, including physics, chemistry and biology, for the session of 1913-1914. Later information shows that the requirement will not begin until in 1914.

In the last line on page 587, also, the higher requirement for the state licensing board of California affects all candidates in 1919 and thereafter, or students matriculating for and after the session of 1915-1916.

Michigan May Report

Dr. B. D. Harison, secretary of the Michigan State Board of Registration of Medicine, reports the written examination held at Detroit, May 22-24, 1913. The number of subjects examined in was 14; total number of questions asked, 100; percentage required to pass, 75: The total number of candidates examined was 34. all of whom passed. The following leges were represented:

PASSED

College	Year Grad.	Per Cent.
Chicago College of Medicine & Surgery	(1913)	84.8
University of Maryland	(1912)	84.8
University of Michigan, Coll. of Med. & Surg.	(1899)	85.4
Detroit College of Medicine	(1913)	78, 80, 81.4, 81.5, 81.8, 81.9, 82.1, 83.5, 88.9, 83.9 84.3, 85.3, 85.5, 85.5, 85.7, 85.8, 85.9, 86.2, 86.6, 86.7, 87. 87.1, 87.2, 87.3, 88.3, 88.8.
Detroit Homeo. College of Medicine	(1909)	79.1
University of Buffalo	(1910)	90.1
Syracuse University	(1911)	87.6
University of Palermo, Italy	(1884)	75.3
University of Budapest	(1905)	84.8

Michigan Reciprocity Report

Dr. B. D. Harison, secretary of the Michigan State Board of Registration of Medicine, reports that from April 7 to July 21, 1913, 23 candidates were licensed through reciprocity. The following colleges were represented:

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Georgia College of Eclectic Med. & Surg.	(1913)	Georgia
Northwestern Univer. Medical College...(1906)	(1911)	Illinois
Chicago College of Medicine and Surgery	(1901)	Illinois
Rush Medical College	(1912)	Illinois
American College of Med. & Surg., Chicago	(1905)	Illinois
Bennett Medical College	(1912)	Illinois
Hahnemann Medical College, Chicago	(1887)	New York
University of Illinois ....(1912-2) Illinois;	(1912)	Kentucky
Medical College of Indiana	(1903)	Indiana
University of Kentucky	(1906)	New Hamp.
University of Louisville	(1912-2)	Kentucky
University of Maryland	(1902)	Ohio
Univer. of Michigan, Dept. of Med. & Surg.	(1898)	Penna.
American Medical Missionary College, Michigan.	(1902)	Kansas
Toledo Medical College	(1897)	Ohio
Hahnemann Medical College, Pennsylvania	(1908)	New York
University of Texas	(1902)	Texas
University of Vermont	(1911)	Vermont
Marquette University	(1912)	Wisconsin

Iowa June Report

Dr. G. H. Sumner, secretary of the Iowa State Board of Medical Examiners, reports the written examination held at Des Moines, June 2-4, and Iowa City, June 5-7, 1913. The number of subjects examined in was 8; total number of questions asked, 100; percentage required to pass, 75. At the examination held at Des Moines the total number of candidates examined was 61, of whom 59 passed and 2 failed. The following colleges were represented:

PASSED

College — Year Grad. — Per Cent.

Chicago College of Medicine & Surgery (1912) 79.1, 93.4; (1913) 84.1, 87.6, 91.

Rush Medical College, Chicago (1899) 79.1; (1913) 87.9, 88.4, 89.

Northwestern University, Chicago (1908) 82.4; (1912) 90.4; (1913) 89.2, 91.2, 93.5, 95.

.....................(1913) 88, 88.7, 89.2

University of Illinois 90.4

Chicago Coll. of Phys. & Surg..... (1905) 94.2; (1913) 83.1

State University of Iowa, College of Medicine... (1911)

Drake University College of Medicine (1913) 83.1, 84.5, 85.9, 86.4, 86.5, 86.9, 87.4, 8[illegible]5, 87.6, 88.4, 88.7, 89, 89.4, 90.1, 90.4, 90.5, 91.4, 91.5, 91.7, 91.7 [illegible] 92.1, 92.6, 93.6.

.....................(1913) 91.2

University of Louisville ....(1912) 84.4

Maryland Medical College ....(1909) 95.1

Tufts College Medical School ....(1897) 85.5

Hamline University ....

Ensworth Medical College (1913 [illegible]2.1. 82.1, 88.5, 89.7 90.

College	Year Grad.	Per Cent.
St. Louis University	(1913)	88.9, 89, 92.9
Columbia Univer., Coll. of Phys. & Surgs., N. Y.	(1910)	91.7
Vanderbilt University	(1913)	87.4

FAILED

College	Year Grad.	Per Cent.
Bennett Medical College	(1911)	80.1*
St. Louis College of Physicians & Surgeons	(1906)	66.5

* Fell below 60 per cent. in obstetrics.

At the examination held at Iowa City, the total number of candidates examined was 21, all of whom passed. Five candidates were licensed through reciprocity. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
State University of Iowa, Coll. of Med.	(1913)	87.1, 88, 88.9, 89.5, 89.6, 89.9, 90.4, 90.6, 90.6, 91.7, 92.1, 92.2, 93, 94.5, 94.7.
State University of Iowa, Coll. of Homeo. Med.	(1910) 89.9; (1913	87.9, 88.9, 89.1, 90.5, 91.2.

LICENSED THROUGH RECIPROCITY

College	Year. Grad.	Reciprocity with
University of Colorado	(1911)	Colorado
St. Louis College of Phys. & Surg.	(1898)	Minnesota
John A. Creighton Medical College	(1912)	Nebraska
Eclectic Medical Institute, Cincinnati	(1897)	Ohio
University of Berlin, Germany	(1903)	W. Virginia

Ohio June Report

Dr. George H. Matson, secretary of the Ohio State Medical Board, reports the written and oral examination held at Columbus, June 2-5, 1913. The number of subjects examined in was 10; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 172, of whom 168 passed and 3 failed. For one candidate the examination was incomplete. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
Yale Medical School	(1912)	89.1
Harvard Medical School	(1912)	80.3
Johns Hopkins University-Medical School		(1910) 85.8; (1912) 82.8; (1913) 82, 91.3.
University of Michigan, Department of Medicine and Surgery	(1913)	86.5.
Detroit College of Medicine	(1913)	79.7
St. Louis University	(1913)	83.9
Ohio-Miami Medical College		(1912) 79.5; (1913) 77.1, 78.7, 79.9, 81.2, 81.6, 82.9, 82.9, 83.6, 83.8, 84, 84.3, 84.6, 84.7, 84.9, 85.2, 85.3, 86.3, 86.4, 87, 88.5, 89.5, 89.6, 91.1.
Starling-Ohio Medical College	(1913)	76.4, 80.1, 80.2, 81.1, 81.4, 81.4, 81.5, 81.6, 81.8, 81.9, 82.2, 82.4, 82.9, 83.1, 83.1, 83.9, 84, 84.5, 84.6, 84.7, 84.8, 84.8, 85, 85.1, 85.2, 85.2, 85.3, 85.3, 85.4, 85.4, 85.6, 85.8, 85.9, 86.1, 86.7, 86.8, 86.8, 86.9, 87.2, 87.4, 87.7, 88.2, 88.3, 88.6, 88.6, 88.7, 89.5, 89.5, 89.7, 89.9, 90.9, 92.3.
Western Reserve University	(1913)	81.5, 81.8, 82.1, 83.6, 85, 85.1, 85.4, 86.4, 86.7, 86.9, 86.9, 87.4, 87.7, 87.7, 87.7, 88, 89, 89.2, 89.3, 89.8, 91.3.
Cleveland College of Physicians and Surgeons	(1913)	79.5, 80.7, 82.3, 82.6, 83.3, 83.8, 84.7, 85.4, 86.3, 86.8, 87.9, 88.3, 88.9.
Cleveland-Pulte Medical College		(1912) 75.5; (1913) 75.2, 75.4, 76.5, 77.9, 78, 78.2, 78.3, 78.7, 78.8, 78.9, 79.9, 80.1, 80.6, 81, 82.1, 82.1, 85.3, 88.4, 88.7.
Toledo Medical College	(1913)	76.4, 79.7, 80.3, 80.8, 80.8, 82, 82.5, 82.9, 83.2, 83.9, 85.8, 86.1, 87.4, 88, 89.2.
Eclectic Medical College, Cincinnati		(1911) 78.8; (1913) 75, 76.4, 76.6, 78.1, 80, 81.1, 82.8, 85.5, 86.6, 88.2, 89.2, 89.3.
University of Pennsylvania	(1912)	91.3

FAILED

College	Year Grad.	Per Cent.
University of Louisville	(1911)	65
Starling-Ohio Medical College	(1913)	70.1
Cleveland-Pulte Medical College	(1913)	72.1

The following questions were asked:

ANATOMY

1. Locate and describe the scapula. 2. Give the course and relations of the brachial artery. 3. Give the boundaries of the fourth ventricle. 4. What structures pass through the jugular foramen? 5. Describe the urinary bladder of a male and give its relations.

PHYSIOLOGY

1. Name the principal varieties of connective tissue. Where are they found and what purpose do they serve? 2. State the disposition of the fat principles of food after digestion; carbohydrate principles; effect of alcohol in small quantities with food. 3. What is undestood by absorption? 4. Name four forces concerned in the circulation of the blood. 5. What effects do extremes of temperature have on respiration? What effect has age? 6. Describe the suprarenal capsules. What is their function? 7. What is the influence of the nervous system in the production of sweat? 8. Name the five laws of reflex action (Pflüger). How do they work? 9. Describe the process known as ovulation. 10. Describe the function of the tympanic membrane; eustachian tube.

PATHOLOGY

1. By what agencies does the body protect itself against the entrance and harmful effects of pathogenic bacteria? 2. Describe morbid anatomy of bronchopneumonia. 3. What changes take place in extravasated blood? Name them. 4. What changes take place in an inflamed part, causing redness and swelling? 5. Describe the process of primary healing; of secondary healing.

CHEMISTRY

1. Give properties and chemical formulas of (*a*) carbon dioxid; (*b*) carbon monoxid. 2. Give a test for indican and state its clinical significance when found in urine. 3. Define (*a*) aldehyd; (*b*) alkaloid (*c*) glucosid. 4. Name and differentiate the three classes of sugar. 5. What are proteids and from what are they derived?

PRACTICE

1. Name the different forms of non-malignant stricture of the rectum. How far above the anus is a simple stricture usually found? 2. Describe your procedure in making a physical examination of the abdomen. 3. Describe the urinary findings in diabetes mellitus and chronic interstitial nephritis. 4. Make a differential diagnosis of pleuritic and pericardial effusion. 5. Define and give etiology of neuritis. 6. Give pathology of typhoid fever. Name 7. Give symptoms and management of between renal and hepatic colic. 9. Give the differen of variola. 10. Give the differential diagnosis between paralysis agitans and tabes dorsalis.

SURGERY

1. Discuss acute osteomyelitis. 2. Describe complete inguinal hernia; give symptoms of strangulation and treatment. 3. Name varieties of goiter and mention the indications for surgical interference. 4. What lesions would you consider in a severe injury about the ankle-joint. 5. In an oblique fracture of the lower third of the femur, state the usual position and give the muscular control of the fragments.

DIAGNOSIS

1. State the difference between organic and functional murmurs. 2. Describe method of examining the size of the spleen. 3. What is the diagnostic significance of edema of one arm and hand? 4. Describe rales, mention varieties and state diagnostic significance. 5. What are friction sounds and what do they signify? 6. What pathologic significance has an increased vocal fremitus? 7. What is dyspnea and what does it signify? 8. Describe diagnostic indications from the character of cough. 9. Describe aphasia: name varieties in reference to localized lesions. 10. In what pathologic conditions is ocular paralysis present?

OBSTETRICS

1. State your views with reference to examinations and what you would expect to learn by them. 2. Name some of the causes and give treatment of hemorrhage after labor. 3. How would you distinguish one shoulder from the other, when the hand and arm cannot be reached? 4. Outline general scheme of treatment for persistent and pernicious vomiting of pregnancy. 5. Give diagnosis and management of the third position of the vertex.

DERMATOLOGY, SYPHILOLOGY AND DISEASES OF THE EYE, EAR, NOSE AND THROAT

1. Describe infantile eczema; outline its treatment. 2. Differentiate scabies from prurigo. 3. How do you recognize and treat scabies? 4. Describe the initial lesion of syphilis. 5. Briefly outline treatment of syphilis. 6. What faulty anatomic condition of the eye constitutes myopia, and how can it be corrected by lenses? 7. Describe simple chronic rhinitis. 8. Describe otitis media purulenta and mention possible complications. 9. Describe iritis; give causes and treatment. 10. Describe laryngeal tuberculosis.

MATERIA MEDICA AND THERAPEUTICS (REGULAR)

1. Briefly discuss the serum and vaccine theories. 2. Name four principal serums, give mode of administration, dose and use of each. 3. What drugs would you use in anemic conditions? Write two prescriptions using the drugs named. 4. Mention two intestinal antiseptics. Give therapeutic use and dose of each. 5. Name three hypnotics: indicate use and dose of each. 6. State the physiologic action, use and administration of hot and cold water. 7. Name two cardiac stimulants and sedatives and indicate dose of each. 8. Give the composition of Dover's powder. State its action, use and dose. 9. Give the physiologic action of nux vomica, name its principal alkaloid and state its use and dose. 10. Give the range of indications for the use of galvanism and high-frequency currents.

MATERIA MEDICA AND THERAPEUTICS (HOMEOPATHIC)

1. Briefly discuss the serum and vaccine theories. 2. State physiologic action, use and administration of hot and cold water. 3. Differentiate between bryonia, phosphorus and causticum in pulmonary affections. 4. Differentiate between nux vomica, carbo veg. and pulsatilla in gastro-intestinal diseases. 5. Name three principal alkaloids of opium, give physiologic dose and antidote treatment for poisoning by one. 6. Give leading characteristics for calcarea carbonicum: sabina; mercurius dulcis. 7. Name three hypnotics; give use and dose of each. 8. Give range of indications for the use of galvanism and high frequency currents. 9. Name four principal serums, give mode of administration, dose and use of each. 10. Name two snake poisons and give general indications for their use.

MATERIA MEDICA AND THERAPEUTICS (ECLECTIC)

I Name some agents used for active hemorrhage. For passive hemorrhage. Give methods of use. 2. In what class of diseases would you prescribe iris versicolor? 3. What symptoms or specific indications call for hacrotys? 4. What is santonin? For what used? Give dose. 5. Give specific indications for apocynum. 6. Give properties, uses and doses of pulsatilla. 7. In what class of diseases and in what form and dose would you prescribe bryonia? 8. In what conditions of the heart would you prescribe digitalis? 9. When is nux vomica to be prescribed? 10. Give range of indications for the use of galvanism and high-frequency currents.

Book Notices

THE MODERN HOSPITAL. Its Inspiration: Its Architecture: Its Equipment: Its Operation. By John Allan Hornsby, M.D., Secretary Hospital Section, American Medical Association, and Richard E. Schmidt, Architect. Cloth. Price, $7 net. Pp. 644, with 207 illustrations. Philadelphia: W. B. Saunders Company, 1913.

Though the authors of this book acknowledge its unfinished character and have anticipated many criticisms which might be made, yet it is a most comprehensive book and covers the large subject of the modern hospital in a most satisfactory manner. The book has reference particularly to the great hospital located in the large city, though the hospital adapted for the smaller city and town has not been neglected; indeed, most or many of the principles applied to the founding, equipment and management of large hospitals are applicable to smaller institutions. It has been the aim of the authors, an architect and a practical hospital manager of many years of experience in one of our large institutions, educated as a physician, to cover the subject from almost every conceivable aspect. The architect for his part has described plans, material and other details of construction and much of the permanent interior equipment of the building. The physician has supplemented this with his ideas of plan and structure and equipment gathered from long experience and much thought on every detail of hospital requirements.

The major portion of the book, of course, is written by the physician, and though the book covers only a little more than 600 pages, the amount of detail in it is really astonishing. It covers the subject of the founding of the hospital and who should be its founders, its character, whether charity, mixed or private, its sources of support, and its running expenses. The latter, together with the cost of construction of the hospital, are discussed not only in a general way, but in detail, giving figures. It is said of the preliminary plans for a hospital that they should not be left to any architect alone, no matter how experienced, but should be discussed by every one interested, so as best to meet the demands for which the hospital is to be adapted. As to the running expenses, the principle is announced that they should be based on the best service and not on the cheapest. Getting down to actual figures, it is stated that the expenses in either a large or small hospital will average about $2.50 per patient per day. The duties of trustees, boards of directors, boards of lady managers, superintendents and heads of departments are discussed in a comprehensive way. On many of these matters, of course, only opinions or general conclusions can be stated, but an attempt is made to view all of the questions from every side, and this is characteristic of the book throughout.

In the matter of the equipment of the hospital, no detail would seem to have been overlooked from surgical operating-room to laundry, from roof-garden and sun-parlor to the vegetable cellar. Here again the experience and preferences of the authors figure largely, and in a multitude of details wide differences would be found in the opinions of different people. Likewise, in the sections on hospital management, the personnel, the hospital staff, hospital interns, head nurses, nurses, etc. These sections are among the most valuable in the book. They are written in a most spirited and interesting manner. Definite opinions are expressed on hospital management, and strong emphasis on all occasions is laid on the necessity for wide authority in the superintendent, who is the general manager of the institution, subject always to the oversight and revision of the board of directors.

Not the least valuable portion of the book is the section on business management, which sets forth complete details of the routine of the business office, referring to the entrance and discharge of patients, the keeping of records and books of account, purchase of supplies, etc.

The subject is such a large one that it is impossible to take up, either to commend or to criticize, many of the details. The book might be criticized, however, on the score of arrangement. It would seem that many of the purely architectural or equipment features of the building, which are discussed in various places throughout the book, might have been brought together more closely under the one head of structural features. In other respects also the subjects might be brought together instead of being discussed in several different places. These details of arrangement, however, can be corrected in a future edition of the book. Mechanically, it is well executed and is well illustrated.

The authors anticipate a criticism as to the illustration and recommendation of certain apparatus manufactured by certain firms or individuals. In view of the authors' statements in regard to this matter it cannot probably be regarded as objectionable. The book covers so many aspects of a modern hospital that it is in a class by itself. No other work with which we are acquainted has attempted to cover it so completely. A reading of this book could not help but be extremely valuable to municipalities, associations or persons contemplating founding a hospital, and it will prove profitable reading to every one interested in hospital management even though they differ widely with the authors in many of the details.

How to Collect a Doctor Bill. By Frank P. Davis, M.D. Cloth. Price, $1. Pp. 98. Newark, N. J.: Physicians' Drug News Company, 1913.

This is largely devoted to an abstract of the exemption laws in the different states. A table giving the time limits for accounts in the different states is convenient for reference. One's opinion regarding some of the practical advice will depend considerably on his attitude toward his profession. The advice to physicians to secure an order from a corporation, signed by a responsible person, before rendering service for which the corporation is expected to pay, is thoroughly sound. Many of the suggestions regarding bookkeeping and business methods can be read with profit by many physicians. Few physicians, however, would care to develop dunning letters to the point of referring, in Letter 3, to "the little child of the delinquent debtor, up in heaven looking down with her angelic eyes, wondering why you did not pay the doctor who worked so hard to give her ease." This would hardly do for a stereotyped letter, so it is provided that "if your patients do not die you might speak of the innocent babe who will grow up to womanhood unpaid for." Of course, you might if you cared to, but some physicians would not care to.

A Course in Normal Histology. A Guide for Practical Instruction in Histology and Microscopic Anatomy. By Rudolph Krause, A.O., Professor of Anatomy at the University of Berlin. Translation from the German by Philipp J. R. Schmahl, M.D. Cloth. Two Parts. Part I. Price $0.75 net. Pp. 86, with 30 illustrations. Part II. Price, $5.50. Pp. 406, with 208 illustrations. New York: Rebman Company, 1913.

This work is published in two separate parts, or volumes. Part I is devoted to the laboratory phase of histology—a description of the microscope, its use and care and general microtechnic. Part II is devoted to the didactic part of histology. This part is divided into lessons, making it particularly suitable as a laboratory guide. The most commendable feature of the work, aside from the arrangement of the subject, are the many beautiful illustrations in black and white and in colors. There can be little original work in a text-book on histology. It is good or bad, depending on the number and value of the illustrations. This work leaves nothing to be wished for. The illustrations are splendid and the student of histology can do no better than to study the illustrations in this book if he would have a good working knowledge of histology. The text supplements the illustrations splendidly.

The Surgery of the Stomach. A Handbook of Diagnosis and Treatment. By Herbert J. Paterson, M.A., M.C., M.B. Cloth. Price, $3.50 net. Pp. 312, with 74 illustrations. New York: William Wood & Company, 1913.

The author has written much of value on this subject which, with much more, is gathered together here. Although a surgeon he lays great stress on the value of a chemical analysis of the gastric contents; in fact, he would have the stomach-tube be a part of the armamentarium of every practitioner so that he can carry out the ordinary qualitative tests and estimate the total acidity. He says that the practitioner, be he consultant or otherwise, who, without the aid which such investigation affords, continues to treat the patient suffering from persistent indigestion or gastric pain, is acting unfairly to his patient and unjustly to himself. He believes that the greater use of the stomach-tube would reduce the mortality from stomach cancer, which, he says, can be treated successfully if diagnosed early. The operation of gastrojejunostomy he terms the keystone of gastric surgery, although not a panacea for all the ills to which the stomach is heir. The methods of investigation of gastric cases, the operations on the stomach, and the preparation of the patient for operation and treatment after operation are all described clearly and concisely. About half the book is devoted to the discussion of gastric and duodenal ulcers. The illustrations, though few in number, are well made. The author has presented in an admirable manner much that is of value to the general practitioner as well as to the surgeon. The book is a commendable one.

Prevention and Control of Disease. By Francis Ramaley, Ph.D., Professor of Biology in the University of Colorado, and Clay E. Giffin, B.A., M.D., Instructor in Surgery in the University of Colorado. Cloth. Price, $3. Pp. 386, with illustrations. Boulder, Colo.: The University Store, 1913.

This book is an attempt to describe for the general public the modern conceptions and knowledge of infectious diseases, and their control and prevention. This is done in order to bring before the intelligent citizen facts necessary to make him sympathetic toward the efforts of health officers and charitable organizations in their campaigns for the stamping out and control of disease. Among the subjects described in non-technical language are various infectious types of disease and the bacteriology, when it is known; the germ theory of disease and the life history of micro-organisms; plant and animal parasites; disinfection and disinfectants; the questions of susceptibility, resistance and immunity; the problem of vaccination; wound infections; some of the protozoal diseases, and the reasons for the rules of hygiene and sanitation. We like the idea of the book. There is tremendous general interest in all that pertains to health conditions, and much is published in the lay press, a part of which at least is not presented in a desirable or accurate form. It is essential that the public should have correct information on these subjects and this book is intended to impart this. Progress in the bacteriology of the infections is so rapid that although this book has just come from the press, we can see where revision must soon be made, even if some of the statements should not already be modified.

Foods: Their Origin, Composition and Manufacture. By William Tibbles, L.L.D., M.D., L.R.C.P., Medical Officer of Health, Nottingham. Cloth. Price $5 net. Pp. 950. Chicago: Chicago Medical Book Company, 1912.

The composition and purity of foods is everywhere receiving wide-spread attention. The importance of dietetics in the etiology and treatment of disease has long been recognized by the medical profession, but it is only within the last few years that the relation of the subject to the health of nations has been seriously considered. The literature of the chemistry of foods is voluminous and is widely scattered; consequently a work of this kind, which contains a great amount of information concerning the origin, composition and manufacture of foods collected from the literature, will prove of value to all who are interested in dietetics. The work is concerned chiefly with the composition of foods and not with their therapeutic uses. Consequently its value to the general practitioner will lie for the most part in its use as a reference work.

Ophthalmoscopic Diagnosis. Based on Typical Pictures of the Fundus of the Eye with Special Reference to the Needs of General Practitioners and Students. By Dr. C. Adam, Assistant at the Kgl. Univ.-Augenklinik, Berlin. Translated by Matthias Lanckton Foster, M.D., Ophthalmic Surgeon to the New Rochelle Hospital. Cloth. Price, $6 net. Pp. 229, with 152 illustrations. New York: Rebman Company, 1913.

This valuable work on the fundus pictures has been dedicated to the late Julius von Michel of Berlin. Especial stress is laid on local fundus findings suggestive of the presence of general disease. The consideration of the subject of myopia is unusually thorough and original. Excellent plates in color illustrate the text.

THE CATARRHAL AND SUPPURATIVE DISEASES OF THE ACCESSORY SINUSES OF THE NOSE. By Ross Hall Skillern, M.D., Professor of Laryngology, Medico-Chirurgical College. Cloth. Price, $5. Pp. 389, with 253 illustrations. Philadelphia: J. B. *Lippincott* Company, 1913.

To set forth in English a thorough and exclusive treatment of the accessory sinuses of the nose has been the author's aim. He seems to have succeeded remarkably well. The book is divided into two parts. In Part I are discussed the anatomy and development of these sinuses, their physiology and bacteriology, the general etiology of sinus disease, the normal mechanism of drainage, cause of chronicity, pathology, symptoms, diagnosis and treatment. In Part II the individual sinuses receive consideration, the frontal, maxillary, ethmoid and sphenoid. The author has endeavored to supply in about 400 pages all that is known of these sinuses, illustrated by many splendid drawings and skiagrams. There are over 250 illustrations, none of which appears to be useless or without value. The book cannot fail to be received with favor. There is also a good and extensive bibliography and the references are placed at the bottom of the page on which they are mentioned, so that there is no need for unnecessary turning of pages in a wild search for a particular reference. Consecutive numbering obviates error and confusion.

FREUD'S THEORIES OF THE NEUROSES. By Dr. Eduard Hitschmann. Authorized Translation by Dr. C. R. Payne, with an Introduction by Ernest Jones, M.D., M.R.C.P. Paper. Price, $2. Pp. 154. Nervous and Mental Disease Monograph Series No. 17. New York: The Journal of Nervous and Mental Disease Publishing Company, 1913.

While Freud's theories are much talked about, but few English-speaking physicians have had the opportunity to acquaint themselves with the essentials of Freud's writings, which are scattered and rather fragmentary. Two books dealing with Freud's theories have recently appeared in English and have received favorable comment in these columns. And now appears a translation of Hitschmann's book, which is an effort at a synthetic presentation of the Freudian theory. Truly, at present there is no excuse for any one to discuss Freud without knowing something about him. Hitschmann, it must be stated, is a close friend and pupil of Freud and especially qualified to give a faithful presentation of both the theory and practice of psychanalysis. The translation is exceptionally good, bearing in mind that the majority of English translations from the German are too literal.

THE RELATIONS OF THE LACRIMAL ORGANS TO THE NOSE AND NASAL ACCESSORY SINUSES. By Prof. Dr. A. Onodi, Director of the Rhinolaryngologic Clinic in the University of Budapest. English Translation by Dr. Dan McKenzie. Cloth. Price, $4.25 net. Pp. 66, with 45 illustrations. New York: William Wood & Co., 1913.

Onodi has established his right to be regarded as authority on nasal relations, and in his latest work on the relations of the lacrimal apparatus to the nose his former high standard is maintained. The previous publications on the anatomy of this region have been far from exhaustive, and it is now especially important to have a clear idea of the anatomic relations, as many new operative procedures on the lacrimal organs are being proposed. The book contains sixty-six pages of text published in the original German, accompanied by the French and English translations, illustrated by photographic plates showing forty-five preparations. The price seems rather large since all the English material in the book could be given in a book one-third the size, with a corresponding reduction in price.

HYPNOTISM AND DISEASE. A Plea for Rational Psychotherapy. By Hugh Crichton Miller, M.A., M.D. With an Introduction by Charles Lloyd Tuckey, M.D. Cloth. Price, $1.50 net. Pp. 252. Boston: Richard G. Badger, 1912.

The author of this little volume is no fanatic on the subject of hypnotism. He appears to have a well-balanced opinion of its possibilities and also of its limitations. The book is a popular exposition of the entire subject and "is addressed to the intelligent layman as well as the open-minded doctor, who, not having studied the subject for himself, is willing to make a preliminary survey of the field." Though the author may be mistaken when he calls hypnotism *rational* psychotherapy, yet it constitutes a distinct and, in some instances, indispensable form of psychotherapy, which medical men should understand, even though it be for the purpose of condemning its universal application. The book constitutes splendid summer reading, not being weighted down with too many technical terms.

ACUTE POLIOMYELITIS (HEINE-MEDIN'S DISEASE). By Dr. Ivan Wickman. Authorized English Translation by Dr. William J. A. M. *Maloney*, F.R.S. Nervous and Mental Disease Monograph Series. No. 16. Paper. Price, $3. Pp. 135, with illustrations. New York: The Journal of Nervous and Mental Disease Publishing Company, 1913.

The well-known monograph on acute poliomyelitis by Dr. Ivan Wickman has at last been published in English. The translation by Dr. Maloney, though faithful to the German text, is not too literal to distract the reader's attention from substance to form. As indicative of the value of this splendid monograph it may be stated that scarcely a report or a review on acute poliomyelitis appears without repeated references to Wickman's work; indeed, Lewandowsky in his extensive "Handbuch der Neurologie" incorporated the entire monograph as Wickman's contribution to the subject. Of especial value to those wishing to pursue the subject further is the complete bibliography at the end of the volume.

OBSTETRIC AND GYNECOLOGIC NURSING. By Edward P. Davis, A.M., M.D., Professor of Obstetrics in the Jefferson Medical College, Philadelphia. Fourth Edition. Cloth. Price, $1.75 net. Pp. 480, with illustrations. Philadelphia: W. B. Saunders Company, 1913.

When a book of this character has gone to four editions in twelve years, little need be said regarding its worth. The book has been thoroughly revised and enlarged by Dr. Davis. It is printed in large, clear type and the illustrations are, as a rule, admirable. Some of them, however, show the effects of wear through use in various editions. While the subject matter is excellent and up-to-date and the type large and clear, the book is printed on such heavy paper that its bulk and weight are almost oppressive, and it would seem that this defect should be remedied in subsequent editions.

INSURANCE MEDICINE. Being Suggestions to Medical Examiners. By Henry H. Schroeder, M.D., Medical Director, Mutual Life Insurance Company of New York. Cloth. Price, $2 net. Pp. 150. New York: William Wood & Company, 1913.

This little book is a compilation of the "Suggestions to Medical Examiners" which have appeared from time to time in the New York *Medical Record*, and contains many practical suggestions and much good advice for the medical examiner for life insurance. It possesses the additional advantage of being brief. Chapters 6 and 7, on "Completion of the Examiner's Report" and "Fraudulent Practices," are especially interesting and of value to the medical examiner for life insurance.

FORTSCHRITTE DER NATURWISSENSCHAFTLICHEN FORSCHUNG. Herausgegeben von Prof. Dr. Emil Abderhalden, Direktor des Physiologischen Institutes der Universität Halle a. S. Volume VIII. Paper. Price, 15 marks. Pp. 308, with 218 illustrations. Berlin: Urban & Schwarzenberg, 1913.

In this volume the medical reader will find two articles of immense interest. "Our Knowledge of the Oldest Tetrapodes," by F. Broili of Munich, is a profound historical study of the entire subject, profusely illustrated and easily understood. The second article, no less interesting, is the one written by Dr. C. Wesenburg-Lund, Hillerod (Denmark), on "Propagation of Sweet-Water Insects, Their Mating and Egg-Deposition."

DISEASES OF THE EYE. A Handbook of Ophthalmic Practice for Students and Practitioners. By G. E. deSchweinitz, A.M., M.D., Professor of Ophthalmology in the University of Pennsylvania. Seventh Edition. Cloth. *Price, $5 net.* Pp. 979, with 367 illustrations. Philadelphia: W. B. Saunders Company, 1913.

This edition contains many of the new ideas which time has shown to be important. Among the additions are special paragraphs on trephining in glaucoma, Toti's operation on the lacrimal apparatus, rosacea keratitis, and Widmark's conjunctivitis.

Medicolegal

Medical Services Necessaries of Life—Husband and Wife Liable for Them When Furnished to Minor Children

(Evans vs. Noonan and wife (Cal.), 128 Pac. R. 794)

The District Court of Appeals, Third District, California, holds that medical services are legally included among the necessaries of life and that parents are liable for them as such when furnished to their minor children. The court says that whether medical services are "necessaries of life," within the legal meaning of that term, is a question which has never been, so far as the court is advised to the contrary, presented to and decided by the courts of that state. At any rate, the court was cited to no recorded decisions in which the question has been passed on. But on principle it can imagine no reason why medical services should not be so considered. To the contrary, a ruling holding them not to be so would appeal to its mind as barbaric both in its conception and conclusion. It is not possible that any court would hold that the obligation of parents to furnish their minor children with the necessaries of life is fully satisfied when they have provided them with food, clothing and shelter, or, to state the proposition in another form, that parents would not violate their obligation to provide their minor children with the necessaries of life by refusing them requisite medical attention when ill.

The word "necessaries," as it has been applied by some of the cases in which its legal import has been interpreted, is a relative term and, as so applied, has been restricted or enlarged in the scope of its legal signification according to the circumstances and conditions of the parties. Some of the cases have held that it is not confined in its application merely to what is essential barely to support life, but that it includes many of the conveniences of refined society, such as ornaments of dress which are usually worn by persons of rank and position. In the present case, however, there was nothing which required the court to go further than to say that, under the law, it most certainly at the least means the common necessaries of life or such things as are proper and requisite for the sustenance of man. With equal certainty these include, besides food, clothing and shelter, such medical attentions in cases of illness as are absolutely requisite to relieve physical suffering and pain and to overcome or conquer disease, if by such attentions it can be done.

Medical services being counted among the necessaries of life, the court further holds that the wife is equally liable with the husband for the payment for such services when the same are rendered to and for their minor children at the request of her husband only, under the terms of section 171 of the Civil Code of California, which, as amended by the legislature of 1905, provides that: The separate property of the wife is liable for the payment of debts contracted by the husband or wife for the necessaries of life furnished to them, or either of them while they are living together, provided that the provisions of this act shall not apply to the separate property of the wife held by her at the time of her marriage or acquired by her by devise or succession after marriage.

The law applicable to the case before the court as made by the pleadings and proof was correctly stated in a requested instruction of the jury that, "in case you find from the evidence that the plaintiff at the request of either Mr. or Mrs. Noonan furnished and performed medical services and attendance to and for one of their minor children, it is the same as though the medical attendance was furnished to defendants themselves, for both parents are responsible for the care of their minor children and necessaries of life furnished to a child is deemed to have been furnished to the parents. While ordinarily a wife is not responsible for any debt of her husband, the law makes an exception in the case of necessaries of life furnished to either or both of them while they are living together as husband and wife. You are instructed that medical attendance, when furnished to a wife, husband or minor child, is deemed by law to be necessaries of life. Therefore, if you find from the evidence that at the time set forth in plaintiff's complaint the plaintiff furnished medical attendance to defendants, or either of them, or at their request to any of their minor children, and that at said times the defendants were married and living together as husband and wife, it is your duty to find for the plaintiff in whatever amount you may find from the evidence is due to him."

Validity of City Ordinance Providing for Good Inspection

(Keiper vs. City of Louisville (Ky.), 154 S. W. R. 18)

The Court of Appeals of Kentucky on a rehearing reverses a former decision dismissing the appeal, and affirms a judgment imposing a fine of $25 on the appellant Keiper for violating a city ordinance in refusing to allow a health officer to make an inspection. The ordinance was one to prevent the manufacture and sale of impure foods and provided that, "Any officer, agent or employee representing the health department, or police officer, of the city of Louisville shall at all times have right of entry for inspection to any building, premises or place of any kind where food products are stored or kept for sale, and to any wagon, railroad car or other vehicle of any kind used for the conveyance of food products to be sold in the city of Louisville; and such officer, agent or employee shall at all times have the right to inspect all apparatus, appliances, utensils or other equipment to be used in connection with the production, handling, transportation or distribution of food products to be sold or offered for sale in the city of Louisville, and such officer, agent or employee shall have the right at any time to take samples of food products therefrom for the purpose of analysis. No person, shall interfere with such health officer or with any agent employee in performance of his official duty when such person has reasonable grounds for recognizing said health officer or agent or employee in his official capacity, nor shall any person hinder, prevent or refuse to permit any inspection or examination aforesaid," etc. The court says that while, under the constitution, the people must be secure from unreasonable search, there was nothing in the record to show that an unreasonable search was imposed on the appellant. In its exercise of the police power to prevent the sale of impure foods, the city may at least provide for the inspection of such foods by a competent inspector, in places where they are offered for sale. An ordinance providing for such inspection does not violate the constitutional provision as authorizing an unreasonable search, and as there was nothing in the record to show that more than this was done, in the case before the court, it must, in the absence of a bill of exceptions, presume that the circuit court ruled correctly. If the ordinance as to the offense with which the appellant was charged was void, so far as it authorized imprisonment, that was no reason why the valid part of the ordinance should not be enforced.

Plaintiffs May be Asked if Willing to Submit to Physical Examinations—States Permitting Examinations

(Chicago, Rock Island & Pacific Railway Co. vs. Hill (Okla.), 129 Pac. R. 13)

The Supreme Court of Oklahoma holds that, in the trial of a personal injury case, on the cross-examination of the plaintiff he should be required to answer the question whether he is willing to submit to a physical examination of the injuries by reputable physicians of the community, acting under the appointment of the court. The court says that the trial court declined to permit such a question to be asked or answered. This ruling was based on the decision of the Supreme Court of the territory of Oklahoma, in *City of Kingfisher vs. Altizer*, 13 Okla. 121, holding that "the courts of this territory cannot order a plaintiff, in an action for an injury to the person, to submit to a surgical examination in advance of or during the trial of the cause." The case was correctly decided, for it followed a decision of the Supreme Court of the United States (*Union Pacific R. Co. vs. Botsford*, 141 U. S. 250), the decisions of which were controlling on the territorial court.

Whether this court would follow that rule now it does not say, because not a question here before it to decide. But it notes in passing that the courts of the following states permit such a physical examination: Alabama, Arkansas, Colorado, Georgia, Indiana, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Pennsylvania, Ohio, Texas, Washington and Wisconsin; in Florida, New York and New Jersey such examination is provided for by statute. In the federal courts and those of Utah, Massachusetts, Montana and South Carolina, an examination is denied.

The question before the court was, not whether a physical examination may be ordered by the court, but whether the plaintiff, on cross-examination, may be asked the question whether he is willing to submit to a physical examination, conducted by impartial physicians appointed by the court. The purpose of a cross-examination, among other things, is to test the truthfulness of the witness, and, if he is the plaintiff, his good faith, the righteousness of his case. In an action for personal injuries it is manifest that the jurors are entitled to all the information which can be produced, not only on the cause of the injuries, but also the extent of the injuries, in order to determine whether the plaintiff should recover at all, and, if so, the amount of his recovery. Would an examination of the injuries by competent and disinterested physicians, appointed by the court and acting under its supervision, aid the jury in ascertaining these facts? Manifestly it would, and the jury would doubtless rely more on the testimony of such a physician than they would on one employed as an expert by one of the interested parties. Would the plaintiff be prejudiced by such an examination? Manifestly he would not, if his case was a bona fide one, and if it was not bona fide the law should not exert itself to assist him in concealing the bad faith. Such an examination, it is manifest, would be in the interest of truth and justice. If the plaintiff declined to submit to it for good reason, he, of course, could explain his reason to the jury. If he declined to submit to it without reason, that fact would doubtless have its influence as affecting his good faith, and it seems to the court that such a question would tend to assist the court and jury in arriving at the truth and would result in no harm to any party asserting a bona fide claim.

Indeed, the very case of *City of Kingfisher vs. Altizer*, 13 Okla. 121, relied on by the plaintiff, recognizes the principle here announced; as does also the case of *Union Pacific R. Co. vs. Botsford*, 141 U. S. 250, which was followed in the Altizer case. On the authority, therefore, of the very cases which deny the right to a physical examination, this court holds that the unreasonable refusal of the plaintiff to submit to one may be considered by the jury as affecting his good faith.

Validity of Ordinance Against Having Unclean Milk Bottles

(People vs. Frudenberg (N. Y.), 140 N. Y. Supp. 17)

The First Appellate Division of the Supreme Court of New York affirms a conviction of the defendant, a driver for a milk company, of having in his possession and having received milk bottles which had not been washed after holding milk, and were unclean. The court says that the evidence would support a finding that the defendant had collected a large number of used milk bottles, some of which had not been washed, that he had taken them to a railway station at Park Avenue and One Hundred and Sixty-Fourth Street and unloaded them on the platform, where they were stacked up. About two hours later the bottles, including the unclean ones, were loaded on cars. The milk company had a cleaning plant at Manhattan Street, and the reason why the defendant did not take the bottles there was that it was out of the way. The defendant made no question as to the facts, contenting himself with attacking the constitutionality of the ordinance under which he was prosecuted, which read as follows, the part attacked being the last sentence: "It shall be the duty of all persons having in their possession bottles, cans or other receptacles containing milk or cream, which are used in the transportation and delivery of milk or cream, to clean or cause them to be cleaned immediately on emptying. No person shall use or cause or allow to be used any receptacle which is used in the transportation and delivery of milk or cream for any purpose whatsoever other than the holding of milk or cream, nor shall any person receive or have in his possession any such receptacle which has not been washed after holding milk or cream or which is unclean in any way." The defendant urged that, on a strict construction of the section, and both sides agreed it should be so construed, it was unreasonable, in that it made it an offense for the milk company to reclaim or retake its own property, if some one else had violated a duty with regard to it. The court has no doubt that this strict construction is precisely what was intended by the board of health, and it fits perfectly with the agricultural law, to which it is merely supplementary. The court is of the further opinion that the sentence objected to is not unreasonable, and is within the police power of the state. It does not deprive the milk company, the defendant's employer, of its property, but merely requires the company, before accepting a bottle or other receptacle from a customer, to insist that that customer shall observe the law and wash out the receptacle. This can be done either by ceasing to deliver milk to a customer who refuses to obey the law, or by lodging an information against the persistent law breaker. That the company had provided a sterilization plant to clean bottles and receptacles did not meet the requirements of law, especially when the bottles were not taken to the plant, but were shipped away in an unclean condition. Both the statute and the ordinance are undoubtedly drastic, but the danger to be apprehended from the use of unclean receptacles for milk intended for human food is so obvious and so well known that drastic measures to prevent the possibility of such use are reasonable and justifiable.

Right of Recovery for Services Though Not Beneficial

(Hall vs. Mooring (Ga.), 76 S. E. R. 759)

The Court of Appeals of Georgia says that this was a contest between two members of the gentler sex. The plaintiff was a practitioner of the art or science of osteopathy, and the defendant either needed, or thought she did (which was the same thing) the services of the plaintiff. Several visits were made at $3.10 per visit, the ten cents being added for street-car fare, and the whole bill amounted to $27.90. The defendant said that she paid all she really owed and that the plaintiff charged her for a number of social calls, during the course of which the defendant was importuned to continue the treatment. The defendant said that she declined to do so and that the services rendered by the plaintiff gave her no relief and were so unsatisfactory that she was forced to resort to a physician of the allopathic school, who administered pills and mixtures in the good old-fashioned way. On the issues of fact the plaintiff outswore the defendant, or at least the jury in the justice's court thought she did, and the judge of the superior court refused to interfere. This was the end of the law so far as this branch of the case was concerned. It would never do to hold that a doctor is entitled to recover only where he cures the patient. If the court did, the members of this learned profession might hesitate to respond in extreme cases where the chances were against them. So far as this court is concerned, the doctors may continue to bury their mistakes and recover for their services as they have always done. If the court were dealing with lawyers, the rule might be different. The defendant said that she ought not to pay the extra ten cents per visit because the plaintiff usually walked. The plaintiff testified, however, that the charge was usual and reasonable. If so, she had a right to walk and save the ten cents.

An Expert Has No Greater Privileges than Any Other Witness

(Dixon vs. State (Ga.), 76 S. E. R. 794)

The Court of Appeals of Georgia holds that only when expressly provided by law can the privilege of a witness resist the demand of justice for the truth and the witness refuse to answer a legal question. A physician is competent to testify as an expert and no expert can refuse to testify because he has not been compensated or will not be compensated for his testimony. An expert, testifying as a witness, has no greater privilege than any other witness.

Society Proceedings

COMING MEETINGS

Am. Academy of Ophthal. and Oto-Laryn., Chattanooga, Oct. 27-29.
American Association of Railway Surgeons, Chicago, Oct. 15-17.
American Roentgen Ray Society, Boston, Oct. 1-4.
Colorado State Medical Society, Glenwood Springs, Oct. 7-9.
Delaware State Medical Society, Dover, Oct. 13-14.
Idaho State Medical Association, Pocatello, Oct. 9-10.
Indiana State Medical Association, West Baden, Sept. 25-26.
Medical Association of the Southwest, Kansas City, Mo., Oct. 7-8.
Minnesota State Medical Association, Minneapolis, Oct. 2-3.
Mississippi Valley Medical Association, New Orleans, Oct. 23-25.
Nevada State Medical Association, Reno, Oct. 14-16.
New Mexico Medical Society, Albuquerque, Oct. 2-4.
Utah State Medical Association, Salt Lake City, Sept. 23.
Pennsylvania State Medical Society, Philadelphia, Sept. 22-25.
Vermont State Medical Society, Burlington, Oct. 8-10.
Virginia Medical Society, Lynchburg, Oct. 21-24.
Wisconsin State Medical Society, Milwaukee, Oct. 1-3.

KENTUCKY STATE MEDICAL ASSOCIATION

Sixty-Third Annual Meeting, held at Bowling Green, Sept. 2-4, 1913

The President, Dr. W. O. Roberts, Louisville, in the Chair.

Officers Elected

For the list of newly elected officers, see The Journal, Sept. 13, p. 877.

The Vaccine Treatment of Pertussis in Children

Dr. H. A. Davidson, Louisville: I have been using a vaccine made from the *Bacillus pertussis*, discovered by Bordet, in an epidemic of whooping-cough among the children of the Kentucky Children's Home. More than fifty cases developed during the epidemic. One patient had received doses of the pertussis vaccine at four-day intervals, which controlled the paroxysm fairly well, but a bronchial cough continued. One-fourth c.c. of a mixed vaccine containing *Bacillus pertussis*, 50,000,000; *Staphylococcus aureus*, 20,000,000; *Streptococcus pyogenes*, 10,000,000; *Micrococcus catarrhalis*, 30.000,000, was injected, and within twenty-four hours there was a marked change in the cough, which soon subsided.

As to the value of pertussis vaccine as a prophylactic, I can produce very little evidence. One infant 10 days old was given 1 to 3 c.c. on arrival in the home. It was afterward exposed constantly to the infection. Within a week, it developed a slight cough, not paroxysmal, which quickly subsided. She was given the doses of vaccine four days apart, first, 1 to 3 c.c.; second, 2 to 3 c.c., and third, 1 c.c. or 20,000,000. The vaccine now on the market contains 50,000,000 bacilli per cubic centimeter and relatively larger doses are given for curative effect.

Altogether in hospital and private practice I have treated about seventy cases of whooping-cough with the vaccine with uniformly good results, in many cases brilliant results.

There is practically no reaction, either local or general, following the injection of the pertussis vaccine. There is a slight reaction both local and general following the introduction of the mixed vaccine. As a rule, three doses are sufficient to cure the whooping-cough. If a cough continues after three doses, then give 1 to 4 c.c. of the mixed vaccine, and if this does not stop the cough look out for tuberculosis glands and make the tests for tuberculosis. I have had such uniformly good results from the vaccine treatment that I heartily recommend it to the general profession as the best known treatment for pertussis.

DISCUSSION

Dr. Lillian H. South, Bowling Green: Pertussis serum costs supplied by the State Board of Health of Kentucky costs $1.20, if ordered through the board. The initial dose is 25,-000,000. The treatment of whooping-cough with this serum has proved satisfactory in my hands. I have used it in two cases as a prophylactic measure. Late in the disease it is better to give a large dose.

Dr. Phillip F. Barbour, Louisville: I have been treating whooping-cough with the pertussis vaccine for nearly two years and have obtained very brilliant results in some cases. The earlier it is administered, the better the results are going to be. I have not seen such favorable results from the vaccine after the whooping has been established as I have seen when it was used before the cough had reached that stage. It would seem that the germs tend to lose their virulency or disappear early in the stage of pertussis. A culture has to be made from an organism obtained from the throat, and practically with the beginning of the whooping, in order to be able to make a culture at all. There are some cases in which the vaccine does not seem to give the results that we desire. While it is not a specific in all cases, it is the best treatment we have for this condition up to the present time. As a rule I give 50,000,000 as an initial dose, repeating the dose every fourth or fifth day.

Epidemic Anterior Poliomyelitis

Dr. Philip F. Barbour, Louisville: The treatment must be adapted to the stages of the disease. At the outset we should attempt to lessen the congestion of the cord by any means available. The application of counterirritants will bring the blood to the surface and away from the congested area. Ergot has been recommended to reduce the size of the vessels, but it does not produce a great effect. Atropin, by sending the blood to the periphery, should prove helpful enough to redden the skin. The use of electricity on the nerves and muscles offers more help and hope than any other agent. Some massage is helpful by promoting the circulation through the muscles. Strychnin and all other forms of tonics and general tonic medication should be continued. Special attention should be paid to the deformities which result from atrophy and loss of control of the muscles. Much can be accomplished by persistent insistence on the patients trying to use any muscle fibers that can be moved voluntarily.

DISCUSSION

Dr. S. L. Beard, Shelbyville: In regard to the use of strychnin in this condition. It is a disease of impaired nutrition, a bad heart with interference of the blood-pressure. The continued use of strychnin will invariably do harm. In fact, I do not know of a more dangerous drug than strychnin. Strychnin does not contract the arterioles; it expands them, and when given continuously is as dangerous as alcohol. It should be condemned most strongly. In the equalization of blood-pressure lies our greatest hope. How are we to do that? First, by systematic rest after the acute symptoms have subsided. Second, by the proper application of hydrotherapy, by proper elimination, and not too active catharsis. Let us regulate blood-pressure so as to improve the nutrition of the parts, for in that lies our greatest hope until something shall have been done along specific lines.

Dr. John J. Moren, Louisville: It has been my misfortune to see a number of cases of anterior poliomyelitis. The cases of this disease we are meeting to-day are not the same as those we met fifteen or twenty years ago. The cases of poliomyelitis to-day have sensory symptoms, and one of the characteristic features is pain at the onset along with the paralysis, and a particular characteristic I have noticed in Kentucky is that after the fever subsides there is marked hyperesthesia of the paralyzed extremity. In early cases I have used hexamethylenamin with excellent results.

Dr. A. C. L. Percefull, Louisville: Along the line of deformities occurring from infantile paralysis, I would like to utter one word of warning. Mothers are overanxious when their children have this condition, and they are willing to grasp at every straw, some of them believing that the children will go through their whole lives with a deformity. It is this anxiety on the part of the mother which leads to exaggeration of the deformity coming from infantile paralysis. This is brought about by the taking of remedies from each family that prescribes a remedy; by using this or that battery or this kind of massage. The muscles that are not paralyzed are overdeveloped and the deformity caused by the paralysis is hastened and the opposite condition results. If you can select a muscle that is paralyzed and apply the galvanic current, you may do some good.

Dr. A. M. Vance, Louisville: If you overstimulate the muscles that are left, thereby causing them to become stronger, there is a greater chance for deformity to develop. My experience is that infantile paralysis gets well through the efforts of Nature, and all the efforts we may make are wasted until it comes to the question of deformity. I do not believe in electricity nor in massage. The nerve cells are destroyed; therefore you cannot do much good. If you can put the muscles into action, you can achieve much better results.

Diagnosis and Medical Treatment of Gastric and Duodenal Ulcer

Dr. Charles G. Lucas, Louisville: Three indications are to be met: first, neutralize any excess of acid; second, prevent spasm, and third, promote healing. The first indication is met by the use of antacids, particularly magnesium oxid and bicarbonate of soda. These may be given in doses of from 10 to 30 grains, in powder form, whenever the patient begins to feel uncomfortable, repeating three or four times a day, according to the indication.

In the treatment of hemorrhage, the first requisite is absolute rest, best secured by morphin given hypodermically and repeated if necessary. The application of a light ice-bag to the epigastrium aids in the checking of the flow of blood. The use of ice-water by tube is recommended by Ewald; in this country Kaufman has been a warm advocate of lavage, believing that thorough evacuation of the contents of the stomach will do more to quiet the organ and stop the bleeding than any other measure. Internally good results have been obtained from epinephrin in repeated doses; from bismuth, in divided doses and in one large dose after lavage. Pure aluminum metal ground into powder and mixed with glycerin into an emulsion like paint, 160 grains to the dose, will almost magically stop hemorrhage from the stomach, except that coming from large vessels. Normal horse-serum has been used extensively and many favorable reports are made concerning it.

How long should an ulcer be treated? I have long been of the opinion that a patient the subject of gastric or duodenal ulcer should submit to the rest cure for at least six weeks. If at the end of that time the symptoms have disappeared or have greatly improved, it is advisable to have him resume his ordinary vocation, but under regular and careful medical observation. If, however, after the first six weeks, when the patient is up and about, he does not regain his strength as we should expect, the cure should be tried again for another six weeks, and after this we have little or no improvement and occult blood is still present in the stool, it is best to refer him to the surgeon.

Diagnosis and Indications for Operation in Gastric and Duodenal Ulcer

Dr. A. David Willmoth, Louisville: The surgeon should operate in the following cases: First, when the symptoms are long continued and do not yield to medical treatment, and particularly when profound anemia results from the repeated hemorrhage; second, to control bleeding that threatens life; third, when perforation has occurred; fourth, to treat subphrenic and other abscesses that occur as complications; fifth, to relieve constriction of the pylorus or an hourglass contraction; sixth, to relieve various indefinite symptoms, not necessarily due to the existence of the ulcer, but following the healing of one. These symptoms are generally due to adhesions which either alter the direction of the pylorus, constrict the stomach, or tie the organ down to surrounding structures.

DISCUSSION

Dr. William H. Wathen, Louisville: Medical diagnoses of gastric ulcer are more often incorrect than they are correct. Moynihan has pointed out that over 50 per cent. of cases of medical diagnoses of gastric ulcer had no ulcer at all. The pathology was found in the appendix. There is no way of knowing positively the pathology of gastric or duodenal ulcer until the abdomen is opened. It is difficult often to differentiate between gastric ulcer and appendicitis. There is often an association of appendicitis with gastric and duodenal ulcer and gall-stones, so much so that there seems to be reason to believe there is some etiologic connection. Acute ulcers, unless complications arise, are seldom surgical and they are very often of septic origin. There is no curative treatment for chronic ulcer except excision. Medical treatment may mitigate the symptoms, but it does not effect a cure. Rest, quietude of mind and body, proper diet, good hygiene and sanitation will do as much as any medical treatment.

Dr. W. W. Anderson, Newport: About a year ago I was called in consultation to see a patient who gave a history of twenty years of chronic gastric hyperacidity, six years of which gave evidence, according to the history of attacks, of ulceration, with hemorrhage, pain, and in the last six months or more there were obstructive symptoms indicating the presence of cancer, ending in perforation and death. Such things ought not to occur. More careful study and examination on the part of the man who first sees the case would be the means of saving lives in cases of this kind. I would make a plea for more exploratory incisions in doubtful cases to determine what the real trouble is. There should be more cooperation in the handling of these cases between the surgeon and internist.

Dr. J. Garland Sherrill, Louisville: I must differ from Dr. Wathen's contention that the only treatment for chronic ulcer of the stomach is excision. I will admit that the ideal treatment for this condition is the removal *in toto* of the ulcerated area, but many of these cases will show very marked improvement and permanent recovery from simple gastro-enterostomy. This is especially the case where the ulcer is large, and where the difficulties of its removal are such that the patient will be unable to withstand a more radical operation. These cases have in many instances gone on to cure. Therefore, I do not believe it is correct to claim that these cases must be subjected to the removal of the ulcer. When the ulcer can be removed surgically, it is a very desirable thing to do.

Dr. Louis Frank, Louisville: There is practically very little difference of opinion as to the line of treatment that should be carried out in chronic ulceration of the stomach. We know that these ulcers, benign though they be in the beginning, ultimately become carcinomatous. We have been taught to depend too much on laboratory diagnosis at the expense of the clinical study of the case. A careful study of the previous history of the patient extending back over years is sufficient, with the physical examination, exclusive of laboratory findings, to enable one to make a diagnosis, and then treatment will depend on judgment as to the duration of the disease.

The Prevention of Tuberculosis

Dr. Dunning S. Wilson, Louisville: The prevention of tuberculosis is not to be accomplished by antituberculosis organizations alone, no matter how excellently they may be managed. We must request the intelligent cooperation of physicians, sociologists, lawyers, employers, employees, charitable organizations, federations of men's and women's clubs, playground leagues, tenement house commissions, law makers, boards of education, public health officials, churches, and in fact every citizen of the state. The prevention of the white plague must go hand in hand with the prevention of the black plague, the prevention of hookworm, cancer, typhoid, infantile diseases, poverty, drunkenness, abortion, blindness, feeblemindedness, insanity, accidents, dishonesty, crime, crop failures and the wanton and improvident destruction of our forests, or the wasteful dissipation of our natural resources, whether by individual or corporation. Finally, the warp and woof of such a scheme must be the leaven of human kindness and a sympathy which is a motive and not an emotion.

Uterine Hemorrhage and Its Significance

Dr. R. C. McChord, Lebanon: We do not see the great majority of cases of cancer of the uterus until a slight irregular hemorrhage appears, and on investigation it is found that this condition has existed for weeks and even months. Its approach is so insidious, and the innate modesty and ignorance of women as to its dangers so great, that the so-called inoperable cancer is frequently found to exist. Women must be taught that any unusual flow of blood, which is persistent, means something, and on the first manifestation of such a condition they should apply to their physician for examination and advice. If physicians would realize that one out of every eleven women of all ages dies of cancer, and that past the age of 35 one woman out of nine would likewise perish, and at the same time consider that its early recognition is the only hope of cure, probably we would be more earnest in our endeavors to educate our clientele as to its dangers, and make them realize the significance of uterine hemorrhage.

DISCUSSION

Dr. W. W. Anderson, Newport: Uterine hemorrhage during the child-bearing period is most often due to non-malignant causes, but the fact that it is due to such causes gives us no right to presume in any individual case that the conditions are non-malignant and demands on our part the most searching care, because as Baldy of Philadelphia said a few years ago, only 2 per cent. of cases of cancer of the uterus, taking them all in all as they come to the physician, are ever permanently cured. They do not always come to the physician as early as they should, and when they do he is slow in finding out what is the matter. These patients should receive a most searching examination to determine the diagnosis and the reasons for the hemorrhage. and we should not presume it is a pelvic condition of something else.

Dr. Edward Speidel, Louisville: It is astonishing how often a hemorrhage from mucous polypi is either not diagnosed or is mistaken as a hemorrhage from cancer. Differentiation is very simple. Vaginal examination and the fact that the tumor presenting has a pedicle leading into the cervix will enable one to make the diagnosis.

Dr. Louis Frank, Louisville: We frequently make an error in looking on all cases of cancer of the uterus as cancer of the cervix. We should not forget the fact that we may have cancer of the body of the uterus in which there is no ulceration, no external manifestation which can be noted by visual examination or which may be felt by digital examination. So in these cases removal of a portion of tissue from the cervix deserves commendation. In the other type of cases the removal of a section of the cervix gives no index of what is going on. The disease is inside the cavity of the uterus. If a section is removed the microscopist should know where it comes from. The tissue should be removed in long sections so that he can examine them in this laboratory, otherwise he may make an error. In cutting sections through the glands obliquely, one will get at the bottom of some of the glands; the cells penetrate into the muscularis, and it is impossible for an expert microscopist to make an absolute diagnosis at all times. In connection with carcinoma of the cervix we must insist on women having examinations if hemorrhages recur, or if the amount of hemmorrhage exceeds the normal hemorrhages during the climacteric.

Dr. A. D. Willmoth, Louisville: In connection with this subject I want to discourage the early and indiscriminate use of the curet. It has done more harm than any instrument ever invented.

Ectopic Gestation; Diagnosis and Treatment

Dr. N. C. Witt, Franklin: Ectopic gestation is operative at any stage on the discovery of the condition; complete removal of the tube and the abnormal pregnancy by the abdominal route. Even when the patient is apparently exsanguinated, we may be enabled to tie off the bleeding points and by the intravenous injection of normal saline save a life. Or if the hemorrhage has stopped and the patient has reacted, we have no assurance that there will not be a secondary and fatal hemorrhage. Finally, if the initial clot held, its liability toward becoming infected would serve as a menace to the woman.

DISCUSSION

Dr. D. C. Donan, Jr., Morganfield: I was called in consultation to see a woman who was taken suddenly ill with the classical symptoms of internal hemorrhage. She was in severe shock. We controlled the hemorrhage by giving saline infusion before making a diagnosis, and when the patient rallied we made a vaginal examination and diagnosed the case as a ruptured ectopic pregnancy. The patient refused operation. We kept her in bed for about ten days. She had a slight relapse, complained of great pain and nausea, and concluded she would go to the hospital. We made all arrangements, but the day before we were to take the patient to the hospital she had a severe hemorrhage and died within an hour. Necropsy revealed a fetus and a gallon of blood in the peritoneal cavity.

Puerperal Eclampsia; Cause and Treatment

Dr. Edward Speidel, Louisville: I advocate surgical measures. No true progress will be made unless such surgical measures are thoroughly established. I can see no justification for cesarean section in eclampsia. If the attacks occur in the seventh or eighth month of pregnancy, then the convulsions can readily be controlled by narcotics, according to the method of Stroganoff. There is no indication for and nothing is to be gained by a hurried operative delivery. At full term a competent obstetrician will always be able to deliver the eclamptic woman through the vaginal route under normal conditions. If the condition is complicated by a contracted pelvis or obstructing tumor, then operative delivery is performed on account of these complications and not on account of the eclampsia. In cases of this kind the surgeon without obstetric experience should at least consult with an experienced obstetrician before subjecting a woman to such a formidable operation.

DISCUSSION

Dr. Virgil E. Simpson, Louisville: While I have been much interested in the advent of Abderhalden's methods of biologic tests as applied to the diagnosis of pregnancy, I feel greater concern in the therapeutic possibilities, through its application in the toxemias, and particularly that of eclampsia. In fact, as Schwartz has well said, "The diagnosis of pregnancy is only a trifling part of this work."

Abderhalden's theory is that free chorionic villi of implanted ovum induce in the maternal organism a reaction which produces digesting ferments for placental tissue.

It is not irrational to conclude that in eclampsia the formation of protective ferments is deficient, and hence intravascular digestion of placental protein is sufficiently imperfect to permit the accumulation of this blood-formed material, resulting in the symptom complex termed eclampsia.

These interesting findings suggest the possibility, in the near future, of a therapeusis with a serum from patients having large quantities of "protective ferments" or from animals so treated as to immobilize these ferments.

Vaccine Therapy

Dr. R. Hayes Davis, Louisville: Vaccines are often a useful adjunct to other treatment and will not infrequently cure a condition where other means have failed. They have a distinctly limited field and should be used only when an accurate diagnosis can be made and where they are directly indicated. Autogenous vaccines are usually preferable and should be used in most infections where possible. Vaccines should be used only by men who understand thoroughly the laws of immunity and know the dangers of improper vaccine treatment, and in acute conditions too great care cannot possibly be exercised.

Traumatic Displacement of the Kidney

Dr. J. H. Peak, Louisville: I have found by experience that the best incision is the one advocated by the Mayos. You will encounter the ileohypogastric nerve, which may sometimes be double. This nerve should not be cut because it supplies the skin over the side of the abdomen and crest of the ilium with sensation, and if injured, it will cause much pain, and if severed, the patient will complain of a peculiar numbness, sometimes for many months. The surgeon should be careful not to include this nerve in his suturing, because such an accident will cause the patient intense suffering for two or three days.

One of the most important points in the postoperative treatment is to avoid the use of opiates, as far as possible, as they produce nausea and vomiting. The bowels should be kept regular by enemata in order to avoid constipation. Enemata are much better and safer than purgatives, which often cause nausea and vomiting. The patient should be kept in a recumbent position for twenty-one days following the operation and should be cautioned against violent exercise or jarring during the period of convalescence.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

Archives of Diagnosis, New York

July, VI, No. 3, pp. 201-308

1 Abdominal Points of Pain and Tenderness. P. Descomps and P. Brousse, Paris.
2 Cardiac Irregularities. E. L. Tuohy, Duluth, Minn.
3 Some Laboratory Features of Painful Oxaluria. B. G. R. Williams and E. M. Williams, Paris, Ill.
4 Prognosis of Eclampsia. A. Shulman, New York.
5 *New Form of Apparatus for Freezing-Point Determinations. E. H. Bartley, Brooklyn.

5. Freezing-Point Determinations.—The apparatus devised by Bartley consists of a Dewar tube A, 22 cm. high and 6 cm. inside diameter, set in a wooden base. This is fitted with a rubber stopper having three holes. Into the large hole is fitted a heavy glass test-tube 20 cm. long and 3 cm. wide passing down to near the bottom of the vessel. Two other holes are for two small brass or copper tubes, one terminating just below the rubber stopper and the other passing to the bottom of the vessel and coiled around two or three times. These coils are perforated with a series of small holes. Inside of the test-tube passing through the rubber stopper is a second test-tube of about the same length and 2.5 cm. in diameter, held in place by a section of rubber tubing drawn over it and separating the two tubes by a narrow space. In operation, this space is filled with alcohol. A delicate thermometer with a platinum wire coiled loosely around its lower end completes the apparatus. In the apparatus used by the author, the stirrer is operated by a toy motor run by an ordinary dry cell. This can be dispensed with, if desired, and the stirrer operated by hand, although this mechanical contrivance makes the apparatus almost automatic.

To use the apparatus, fill the vessel about one-third full of ether or carbon disulphid. Insert the rubber stopper tightly, connect the shorter metal tube with a Richards aspirator pump, attached to the water service. The liquid to be frozen is placed in the inner test-tube. There should be enough liquid to cover the mercury bulb of the thermometer, when the latter is lowered to the bottom of the tube. The water is then started through the Richards aspirator pump, which draws air through the ether in a series of bubbles, causing it to evaporate. Owing to the well-known principle of the Dewar tube, applied in the popular thermos bottle, almost all the heat used to vaporize the ether is derived from the thin layer of alcohol between the two test-tubes and from the liquid under examination. There is no frosting of the outer vessel, the whole system remains clear and transparent and the thermometer can easily be read at all times. When the temperature reaches zero, the stirrer is started.

It will be observed that the temperature steadily sinks from —2 to —3 C. before freezing begins, that is, two or more degrees below the true freezing-point of the liquid. Then, suddenly, freezing occurs and the temperature-reading rises to a fixed point and remains there for some minutes. When this point is reached the water is shut off and an accurate reading taken. This is the freezing-point of the liquid. There is no necessity of adding ice to start the freezing as is usually done in other forms of apparatus. The whole process is automatic and all the observer need do is to regulate the flow of water running through the pump and read the thermometer. It is advisable, when the temperature reaches zero, to draw the air through the ether more slowly until freezing takes place, by partly shutting off the flow of water. The thermometer should be accurate and should easily indicate 0.5 degree. For accurate work the Beckmann adjustable thermometer should be used. The thermometer is the most important and most expensive part of the apparatus. The rest of the apparatus is cheap and can be put together from glassware kept in stock by any of the larger dealers in chemical apparatus. The amount of ether required for a determination is not over 25 c.c., and costs but a few cents.

Archives of Pediatrics, New York

August, XXX, No. 8, pp. 561-640

6 *Some Fallacies Regarding Treatment of Tuberculous Adenitis. J. H. Jopson, Philadelphia.
7 Comparative Value of Various Sugars in Feeding of Infants. C. C. Haskell, New York.
8 Blood-Pressure in Infants, Especially in Gastro-Enteritis. H. K. Hill, Philadelphia.
9 Case of Pyloric Stenosis Under Medical Care. C. H. Lefcoe, Philadelphia.
10 *Case of Hydrocephalus. J. Speese, Philadelphia.
11 Normal and Adventitious Danger Periods for Pulmonary Disease in Children. W. C. Williams, Rutherford, N. J.
12 Nerves and Nursing Mother. C. A. Frost, Utica, N. Y.

6. Tuberculous Adenitis.—Speaking of tuberculin, Jopson says that this is a form of therapy which will in time largely supplant surgery in the treatment of tuberculous lesions. It is a valuable adjuvant to surgical treatment in other tuberculous conditions. It may prove useful in preventing recurrence in cases in which repeated operations have been performed, and sometimes results in apparent arrest, improvement or cure when operations have been impossible or ineffectual.

10. Case of Hydrocephalus.—This case is reported by Speese because of the extensive degree of hydrocephalus present. The measurements of the head were as follows: circumference, 60 cm.; from the anterior fontanel to the posterior part of the posterior fontanel, 35 cm.; from one parietal eminence to the opposite, 31 cm.; from the top of one ear to the other, 35 cm. The lower extremities were completely paralyzed and the reflexes were absent, but wasting of the muscles was not noted. The general condition of nutrition was excellent, and the child took nourishment without trouble. The Wassermann reaction was negative. The case belonged to the congenital type, the cause of obstruction being obscure.

Boston Medical and Surgical Journal

August 28, CLXIX, No. 9, pp. 297-336

13 Immigration and Prevention of Insanity. T. W. Salmon, New York.
14 *Cooked Green Vegetables in Treatment of Acute and Chronic Diarrheas. C. Wilson, Birmingham, Ala.
15 Geographical Distribution of Mental Disease in Massachusetts, 1901-1910: Insanity Rates of Smaller Cities. E. E. Southard, Boston.
16 Removal of Adenoids and Tonsils in Children. A. Coolidge and F. E. Garland, Boston.
17 Congenital Hypertrophic Stenosis of Pylorus. C. G. Mixter, Boston.

September 4, No. 10, pp. 337-372

18 Mode of Transmission of Poliomyelitis. M. J. Rosenau, Brookline, Mass.
19 Neurology of Child: Nervous and Mental Sequelae of Encephalitis in Children. W. P. Lucas and E. E. Southard, Boston.
20 Cesarean Section; Its Indications; Twenty Cases. F. L. Good, Boston.
21 Treatment of Diabetes Mellitus. E. P. Joslin, Boston.
22 Complement-Fixation Test in Diagnosis. J. H. Wright, Boston.

14. Treatment of Acute and Chronic Diarrheas.—Wilson has been treating all chronic diarrheas, and the acute diarrheas and dysenteries that resisted the ordinary treatment, with opium, bowel irrigation, etc., with a diet of spinach, turnip greens and mustard tops with the most gratifying results. It has been his custom to begin by giving a tablespoonful or more of spinach, turnip greens or mustard four times a day, continuing from one to two weeks; no other food being allowed unless patients become very anxious for it, when a little dry toast or common corn bread is given. The first few stools after beginning the diet will show the undigested food, but immediately following this the movements become normal in consistency, and usually after the second day an enema will be required to move the bowels. When there has been distention of the bowels, the flatulence disappears, and when there is tenesmus the relief is most remarkable. Wilson's first experience with this diet was confined to chronic conditions, but later he found that the same good could be accomplished in the acute dysenteries of early spring which failed to respond to the ordinary dose of salts or oil with a little opium in some form. In these acute conditions he has rarely found it necessary to give a dose of opium after beginning treatment. Spinach is prepared in the usual way, insisting on a little more thorough cooking. Turnip greens and mustard, a diet largely used in the rural districts of the South, have given the best results, but when these cannot be had, spinach answers well and is better borne by delicate stomachs. Wilson usually insists on patients continuing the use of the diet with lunch and dinner for some weeks after getting on regular diet. In two patients suffering with pellagra, the diarrhea has been entirely relieved by this diet, but others have not seemed to be benefited by it. Amebic dysentery is improved, but the cure is rarely permanent.

California State Journal of Medicine, San Francisco

August, XI, No. 8, pp. 297-340

23 *Gall-Tract Disease—Some Clinical Features Frequently Overlooked in Diagnosis. C. M. Cooper, San Francisco.
24 Surgical Treatment of Gall-Bladder Disease. W. I. Terry, San Francisco.
25 Cholelithiasis with Short Review of One Hundred Necropsies. W. Ophüls, San Francisco.
26 Work of Pasteur Division of State Hygienic Laboratory. J. C. Geiger, Berkeley.
27 Tuberculin. J. C. King, Banning.
28 *Intravenous Administration of Diphtheria Antitoxin. R. B. Mixsell, Pasadena.
29 Bacteriology of Urine in Relation to Movable Kidney. D. Hadden, Oakland.
30 Carbohydrate Cures in Diabetes. E. Schmoll, San Francisco.
31 Effect of Momentary Contact with 18,000-Volt Current. P. K. Brown, San Francisco.
32 Symptomatology of Gall-Bladder Disease. H. C. Moffitt, San Francisco.

23. **Gall-Tract Disease.**—The normal gall-bladder, Cooper says, can be completely emptied by comparatively light pressure during exploratory laparotomy. If it cannot it should be assumed that there is some hindrance to the outflow. If one ligatures the common bile-duct in the dog, one can still completely empty the gall-bladder by comparatively light pressure, the bile filling up the hepatic ducts. It seems not improbable that the same might be possible in man with an acutely developing common-duct block. Whether or not with a block of some duration this would be likely to occur is another question, but it would seem wise for the surgeon in his gall-bladder work to see the course the bile takes when he squeezes the gall vesicle. Cooper emphasizes the words "light pressure," since with a block at Vater's papilla it is possible that bile could be forced into the pancreatic ducts. The outside of an organ is no real clue as to what is within. In the case of gall-bladder infection simulating malignant endocarditis that Cooper saw, the gall-bladder was not enlarged, and its outside seemed healthy to the surgeon; yet a drop of bile drawn off through a hypodermic syringe and examined microscopically was seen to teem with organisms, and the drainage of this healthy-looking gall-bladder cured the patient. In the angle between the body and neck of the gall-bladder is a lymph-node which when indurated feels not unlike a calculus. In cholycystitis the lymph-nodes up and down the common duct are found to be enlarged. Lymph-node enlargement then must not in doubtful cases be interpreted to mean a malignant condition.

28. **Intravenous Administration of Diphtheria Antitoxin.**—Mixsell asserts that the intravenous administration of antitoxin in young children, although not always easy, is perfectly safe when done with skill and care. The operation does not, as a rule, commend itself to private practice and ordinarily should be performed only under the best of conditions. There appears from a study of 158 cases to be so little clinical difference in the results obtained from the intravenous and subcutaneous exhibition of antitoxin that we are not warranted in asserting that one method is more efficacious than the other. Except in severe septic cases, therefore, and cases seen late in the disease, the subcutaneous method is to be preferred. Antitoxin given subcutaneously should be given in large initial doses.

Georgia Medical Association Journal, Augusta

August, III, No. 4, pp. 109-144

33 Plea for Psychopathic Wards and Hospitals. Y. H. Yarbrough, Milledgeville.
34 Sterilization of Confirmed Criminals, Idiots, Rapists, Feeble-Minded and Other Defectives. W. L. Champions, Atlanta.
35 Lawyer and His Pauper Client; Doctor and His Charity Patient. J. G. Dean, Dawson.
36 Value of Tuberculin Test in Dairy Herds Supplying Milk to City. C. A. Smith, Atlanta.
37 *Results of Pasteur Treatment in Hydrophobia. C. B. Greer, Atlanta.
38 Infant Mortality. N. M. Moore, Augusta.
39 Outlook for Pediatrics in Southern States. C. A. Rhodes, Atlanta.
40 Medical School Inspection. H. J. Baker, Augusta.
41 Hemoglobinuria Fever. L. B. Royal, Girard.

37. Abstracted in The Journal, May 31, 1913, p. 1733.

Journal of Abnormal Psychology, Boston

August, VIII, No. 3, pp. 137-216

42 Relation of Erotic Dreams to Vesical Dreams. H. Ellis, London.
43 Psychanalytic Study of Severe Cases of Hysteria. L. E. Emerson, Boston.

Journal of Experimental Medicine, New York

September, XVIII, No. 3, pp. 219-316

44 Identity of Precipitins and Protein Sensitizers (Albuminolysins). H. Zinsser, San Francisco.
45 *Total Non-Protein Nitrogen of Blood in Nephritis and Allied Conditions. C. B. Farr and J. H. Austin, Philadelphia.
46 *Study of Cerebrospinal Fluid in Acute Poliomyelitis. F. R. Fraser, New York.
47 Cultivation of Amebas in Pure Culture on Autolyzed Tissues. M. Couret and J. Walker, New Orleans.
48 *Excretion of Glycuronic Acid in Pneumococcus Infections. F. Medigreceanu, New York.
49 *Histogenesis of Blood-Platelets. W. H. Brown, Chapel Hill, N. C.
50 *Mechanism of Growth of Connective Tissue. A. Carrel, New York.
51 *Influence of Temperature on Action of Strychnin in Frogs. T. S. Githens, New York.
52 *Elimination Through Mucosa of Urinary Bladder. I. S. Kleiner, New York.
53 Cultivation of Parasite of Rabies. H. Noguchi, New York.

45. **Non-Protein Nitrogen of Blood in Nephritis.**—In a series of non-nephritic individuals the total non-protein nitrogen of the blood, determined by Folin's method, was found by Farr and Austin to lie between 15 and 43 mg. per hundred c.c. From 50 to 60 per cent. of this was in the ammonia-urea fraction. In cardiovascular disease with renal congestion, but without other renal lesion, there was no evidence of increase of non-protein nitrogen in the blood, or of alteration of the ammonia-urea percentage. In chronic nephritis with marked albuminuria and edema there was very little, if any, increase or alteration. In chronic nephritis with hypertension the non-protein nitrogen was definitely increased, ranging from 40 to 180 mg. per hundred c.c. of blood. The percentage of the ammonia-urea fraction was usually higher than in non-nephritic cases. Cases showing high non-protein nitrogen values were subject to rapid fluctuations in these values in the course of a few days. As a rule, clinical improvement was associated with a fall of the non-protein nitrogen figures to nearer the normal range. Uremia was almost always accompanied by an increase of non-protein nitrogen in the blood, but no constant relation could be established between the degree of increase and the tendency to uremia. The authors' cases have not yet been followed for a long enough period to admit of conclusions as to the possible relation between the degree of non-protein nitrogen retention and ultimate prognosis. They believe this method to be a valuable aid in the clinical study of nephritis and that it can readily be carried out in any well equipped clinical laboratory.

46. **Cerebrospinal Fluid in Acute Poliomyelitis.**—The spinal fluid in the 126 cases of acute epidemic poliomyelitis examined by Fraser was usually clear and colorless and did not appear to be under any great amount of pressure. It showed changes in the number of cells present, or in the globulin content, or in both, in the majority of patients examined on the first few days after onset of symptoms. The number of cells was usually highest during the first week, and in one case reached the figure of 1,221 per cubic millimeter. The globulin reaction was usually most marked during the third week. The number of cells diminished rapidly and was above normal in only 32 per cent. of the cases in the third week. The increase in the globulin reaction persisted to the fourth week and might be present for a considerably longer period. The cell increase was due almost invariably to mononuclear

cells of various types. The lymphocytic type of cell was the most common. A high polymorphonuclear count was noted in the very early stages. All the fluids reduced Fehling's solution. The examination of the spinal fluid may be of value in diagnosis in the preparalytic stages and in abortive cases.

48. **Excretion of Glycuronic Acid in Pneumococcus Infections.**—It has been found by Medigreceanu that the amount of glycuronic acid excreted in the urine, estimated by Tollens' furfurol distillation method, is increased during the febrile period of almost all cases of lobar pneumonia in man. Patients weighing from 57 to 70 kg. excrete during the febrile period from 0.8 to 1.3 gm. of glycuronic acid in twenty-four hours, while the output of a normal individual of the same weight, age and under similar conditions would not exceed from 0.4 to 0.6 gm. This increased output is not dependent on outside factors; it is attributable to pathologic changes of the organism itself during the disease. Similar observations have been made in postpneumonic empyema and bronchopneumonia. Fasting rabbits, with general pneumococcus infection, have also shown a marked increase in the output of glycuronic acid during the pathologic process. Whether the conjugated substances with the glycuronic acid in the cases studied have the same origin and are qualitatively the same as under normal conditions, or whether we are dealing with different compounds, has not yet been determined.

49. **Histogenesis of Blood-Platelets.**—Brown believes that under normal circumstances blood-platelets are largely derived from the megakaryocyte of the blood-forming organs. The transitional leukocyte, representing a persistent form of the embryonic premegakaryocyte, is a circulating homologue of the megakaryocyte and probably plays some part in normal platelet formation. Under conditions of excessive demand for platelet production there may be a greater or less reversion to an embryonic mode of platelet formation in which less highly specialized cells than the megakaryocyte participate in platelet production. In addition to the megakaryocyte, the cells that have been observed to take part in platelet formation are hyperplastic endothelial cells in the marrow, and mononuclear and transitional cells (premegakaryocytes) in the marrow, spleen and blood.

50. **Mechanism of Growth of Connective Tissue.**—When connective-tissue cells have been cultivated for a certain length of time in a medium which has been repeatedly changed, Carrel says that a definite relation arises between the rate of growth of the cells and the composition of the medium. It is possible, by adding to the culture-medium a given quantity of certain substances such as embryonic juices, to foresee the extent to which a fragment of tissue composed of a given strain of cells will increase in a given time. The rate of growth of a strain of cells can be accelerated or retarded by the addition to the medium of activating or retarding substances. The dynamic condition of a strain of connective-tissue cells which have been living in a given medium for some time is not a definitely acquired characteristic, but a temporary state, and is the product or function of the medium in which the cells are living, and is readily modified merely by altering the composition of the medium. A knowledge of the characteristics of the growth of connective tissue described has led to a new result—the indefinite proliferation of a strain of connective-tissue cells outside of the organism. The strain of connective tissue originally obtained from a fragment of chick embryo heart, which had been pulsating *in vitro* for 104 days, was still actively alive after sixteen months of independent life, and more than 190 passages. The rate of proliferation of the connective tissue sixteen months old equaled and even exceeded that of fresh connective tissue taken from an 8-day-old embryo. It appears, therefore, that time has no effect on the tissues isolated from the organism and preserved by means of the technic described. During the sixteenth month of life *in vitro* the cells increased rapidly in number and were able in a short time to produce a large quantity of new tissue. This fact, therefore, definitely demonstrates that the tissues were not in a state of survival, as was the case in certain earlier experiments, but in a condition of real life, since the cells of which they were composed, multiplied indefinitely in the culture-medium.

51. **Action of Strychnin in Frogs.**—The main results of this investigation are summarized as follows by Githens: Doses of strychnin amounting to 0.0006 mg. per gram of frog will cause tetanus at all temperatures between 5 and 30 C. (between 41 and 86 F.), although at low temperatures the tetanus may appear late. A dose of 0.0003 mg. per gram of frog will frequently produce tetanus at 5 C. as well as at 30 or 27 C. (80.6 F.), but may nevertheless fail to produce any reaction at such an intermediary temperature as 21 C. (69.8 F.). Smaller doses, 0.0002 mg. per gram, will cause tetanus in the cold but not at high temperatures.

52. **Elimination through Mucosa of Urinary Bladder.**—Kleiner asserts that the bladder is practically impermeable for diffusible substances present in the blood in great excess even in the absence of the kidneys, the chief organs of elimination of the body.

53. **Cultivation of Parasite of Rabies.**—About fifty series of cultivations were made by Noguchi with the brain or medulla removed aseptically from rabbits, guinea-pigs and dogs infected with "street" virus, "passage" virus or "fixed" virus. Usually the animals were etherized just before spontaneous death occurred. The method that has yielded the result to be reported is similar to that employed successfully for the cultivation of the spirochetes of relapsing fever. In the cultures very minute granular and somewhat coarser pleomorphic chromatoid bodies arise which on subsequent transplantation reappear in the new cultures through many generations. The same bodies, so far as appearances are concerned, are obtained from "street," "passage," and "fixed" virus. The smallest of these bodies are just on the limit of visibility with the Zeiss apochromatic 2 mm. lens.

On four different occasions Noguchi observed in the cultures from "passage" and "fixed" virus nucleated round or oval bodies surrounded with membranes totally different from the minuter granular bodies, although arising in the cultures in which the latter occurred. Their appearance was sudden and their duration four or five days, when they diminished coincidently with an increase in granular bodies. In one of the four instances the larger bodies appeared in a culture prepared from the brain of a rabbit previously inoculated with a culture of "passage" virus which had given rise to the symptoms of rabies. In two of the instances the larger nucleated bodies arose in cultures prepared from "fixed" virus in which Negri bodies were difficult to demonstrate either in sections or in films. The cultivated nucleated bodies are actively multiplying, by division or budding, and exhibit the appearance not of bacteria but of protozoa. In size they range from about 1 to 12 microns. Under the dark-field microscope, as in the stained preparation, they show definite characters. The center is nuclear and the membrane is distinct and highly refractive. The united individuals in a multiplying mass may be enclosed for a time in a common capsule (?). By inoculating cultures containing the granular, pleomorphic or nucleated bodies, rabies has been reproduced in dogs, rabbits and guinea-pigs, as shown by the typical symptoms and positive animal inoculations; while the film preparations from the brain of the animals contained always the granular and sometimes the nucleated bodies in large numbers.

Journal of Nervous and Mental Disease, Lancaster, Pa.

August, XL, No. 8, pp. 489-550

54 *Analysis of Cerebrospinal Fluid in One Hundred and Nine Cases of Disease of Nervous System Not Including Acute Meningeal Affections. W. F. Schaller, San Francisco.
55 Piblokto or Hysteria Among Peary's Eskimos. A. A. Brill, New York.
56 *Trigeminal Dural Neuralgia. B. R. Tucker, Richmond, Va.

54. **Analysis of Cerebrospinal Fluid.**—Schaller attaches great importance to the information derived from the analysis of the cerebrospinal fluid in all cases of nervous disease in which the diagnosis appears in doubt. In his series it was exceptional that the clinical findings were at variance with the laboratory findings. This occurred in two cases of paresis, in

a case of pes planus and in one case of progressive muscular spinal atrophy. In regard to the pressure of the fluid, the globulin and cell content, his experience does not differ materially from the experience of the Hamburg school. He believes, however, that even in cases of chronic meningeal inflammation, of which the syphilitic process is a type, the estimation of the total protein is of value. Six cells per cubic millimeter appears the upper limit of normal. The Wassermann reaction in the fluid is highly characteristic of a process of syphilitic origin and, generally speaking, is of greater significance than the blood Wassermann when it is desired to establish the nature of a given nervous disorder.

Schaller agrees with Hauptmann that the positive Wassermann reaction in the larger amounts of fluid is also very characteristic of nervous syphilis. He has no case in which the clinical evidence was against the assumption of a syphilitic affection in which the fluid was negative in the smaller amounts and positive in the larger amounts. In his series of tabes cases he found the Wassermann reaction to be more frequently positive in the fluid than in the blood. This is opposed to the later view of Nonne but is in accord with the opinion of most observers. In cerebrospinal syphilis the reaction occurred more often in the blood than in the fluid. This is in accord with the original experiences of Nonne who thus sought to establish a differential point between the true syphilitic and the parasyphilitic affections, which opinion he has later modified from his experience in tabes.

56. **Trigeminal Dural Neuralgia.**—Tucker has observed in the last five years a type or variety of head pain, neuralgic in character, yielding but slightly to the usual analgesics, having more or less distinct manifestations and due, in his opinion, to neuralgia in the dural branches of the fifth nerve, just as tic douloureux, with which it is at times associated, is due to neuralgia in its peripheral branches. For this condition he has selected the name of trigeminal dural neuralgia. The cause of trigeminal dural neuralgia seems to be the same as in trifacial neuralgia, which is usually constitutional. These causes are most frequently malaria, rheumatism, diabetes, anemia, syphilis, arteriosclerosis and sometimes other general disturbances. The nature of trigeminal dural neuralgia is that it occurs in attacks of sharp, intense pain of irregular periodicity; that nausea, vomiting, flashes of light and familial tendency are not prominent features; that the pain, as a rule, is unilateral and may radiate to the face, neck or shoulders; that the pain does not yield to the usual headache remedies; that vasomotor and trophic disturbances are common; that this head pain cannot be traced to the usual causes of headache producing changes in cerebral circulation, but that it appears to be due to chronic systemic diseases like chronic rheumatism, chronic malaria or arteriosclerosis, and that remedial medication directed toward the conditions just named usually cures the dural neuralgia.

Tucker reports nine cases. Most of these patients are in middle life, a hereditary factor is practically absent, the pain is sharp and intense, the supposed cause is a chronic constitutional condition, exciting causes are variable, and radiating pains, tic douloureux and vasomotor disturbance are of common concomitance. These headaches have extended over periods of from eight months to twenty years; in frequency they vary from a few days to a few weeks and are of irregular periodicity; the attacks themselves last from a few hours to several days; the pain is usually unilateral, previous treatment has at best had only temporary effect and these cases yielded to specific medication directed to the underlying cause.

Laryngoscope, St. Louis

August, XXIII, No. 8, pp. 801-880

57 Recent Views Regarding Otosclerosis. T. Harris, New York.
58 Technic of Labyrinth Operation. E. B. Dench, New York.
59 Diagnosis of Rupture into Lateral Ventricle and of Acute Internal Meningitis. E. Ruttin, Vienna.
60 Vertigo. P. Friedrich, Kiel, Germany.
61 Tumors of Septum. R. H. Johnston, Baltimore.
62 Case of Phlegmon Starting as Peritonsillar Abscess and Extending Downward as Far as Second Ring of Trachea. G. L. Richards, Fall River, Mass.
63 Simplified Technic for Removal of Faucial Tonsils. L. F. Long, Zanesville, Ohio
64 Chronic Stenosis of Larynx and Trachea: Report of Case C. A. Leavy, St. Louis.
65 Results in Twenty Cases of Laryngeal Diphtheria Requiring Tracheotomy. C. E. Purcell, Paducah, Ky.
66 Goiter from Standpoint of Specialist. M. B. Tinker, Ithaca, N. Y.
67 Improved Audiometer. H. Hays, New York.
68 Endoscopic Syringe. C. Jackson, Pittsburgh.

Medical Record, New York

August 30, LXXXIV, No. 9, pp. 369-414

69 *Further Experiences with Duodenal Ulcer. M. Einhorn, New New York.
70 Pathology of Simple and Exophthalmic Goiter. L. B. Wilson Rochester, Minn.
71 *Results of Intravenous Injections of Extracts of Goiter on Blood-Pressure in Dog. J. M. Blackford and A. H. Sanford Rochester, Minn.
72 *Variations of Urea Content of Blood, with Practical Method for Its Determination. G. W. McCaskey, Ft. Wayne, Ind.
73 Clinical Interpretation of Chronic Abdominal Enlargement in Children, with Special Reference to New Differential Sign between Rachitis and Tuberculous Peritonitis. H. B. Sheffield, New York.
74 Roentgenotherapy of Eczema. M. K. Fisher, Philadelphia.
75 Congenital Stenosis of Pylorus. A. Strauch, Chicago.
76 Case of Saccharomycetic Infection of Lungs. W. Wovschin New York.

69. **Duodenal Ulcer.**—The indications for surgical intervention in duodenal ulcer in Einhorn's opinion are as follows: 1. Perforation requires immediate operation. 2. Recurrent profuse hemorrhages (hematemesis or melena or both) endangering the life of the patient require a prophylactic interval operation. 3. Frequent small hemorrhages, not being influenced by rational treatment, leading to an appreciable degree of constant anemia, demand operative intervention. 4. Patients with constant continuous hypersecretion, accompanied by intercurrent *ischochymia*, not yielding to treatment, should likewise be operated on. 5. Severe pains, not influenced to a considerable extent by a repeated course of rational medical treatment, form a strong indication for operative measures.

71. **Results of Intravenous Injections of Extracts of Goiter on Blood-Pressure in Dog.**—The authors found that a powerful depressor substance exists in exophthalmic goiters and that a primary injection establishes tolerance to the action of further injection. Atropin does not inhibit its action The substance does not behave physiologically like cholin The action is chiefly through peripheral dilatation aided by some diminution in cardiac output. Irritability of the vagus is not decreased. The existence of a crossed tolerance between the depressor action of extracts of exophthalmic goiters and of serum from patients with exophthalmic goiter suggests that the two substances are the same.

72. **Variations of Urea Content of Blood.**—McCaskey isolates the urea by a modification of the method described by Herter. As finally worked out the technic is as follows: Five c.c. of blood are taken from an elbow vein by a syringe and poured directly into 60 c.c. of absolute alcohol contained in a suitable flask at the bedside. This is allowed to stand twenty-four hours, when it is filtered and the precipitate washed with hot distilled water. This is evaporated to dryness at moderate temperature, after which the residue, which with proper technic contains practically all of the urea, is redissolved in 5 c.c. of distilled water. The urea is then determined with a modified Hüffner apparatus by the hypobromite method. The ordinary gas-collecting tube or eudiometer for urine, which measures about 13 mm. in diameter, is much too large to measure the gas from the minute quantities of urea found in the blood, so that McCaskey had a special tube made about 4 mm. inside diameter and graduated in 0.01 c.c. One c.c. of gas forms a column about 10 cm. long, representing 0.056 (1/18 per cent.) of urea. This is about the high normal limit, but 0.01 c.c. of gas can be measured and this would be equal to about 0.00056 per cent. The total length of the tube is such that percentages up to 0.5 could be determined, and such relatively large quantities of urea in the blood are very rare.

New Mexico Medical Journal, Las Cruces

August, X, No. 5, pp. 113-132

77 Amebic Dysentery. E. C. Prentiss, El Paso, Tex.
78 Paranoia. C. M. Yater, Roswell.

New York Medical Journal

August 30, XCVIII, No. 9, pp. 401-448

79 Analysis of Five Hundred Fatal Medical Cases in Tropics. W. E. Deeks and W. G. Baetz, Canal Zone.
80 Nervous Conditions and Their Relations to Pelvic Diseases. J. H. Carstens, Detroit, Mich.
81 Myopia Prevention by Teachers. W. H. Bates, New York.
82 Study of Stillbirths. L. W. Thomas, New York.
83 Report of Imbecile with Paralysis. J. A. Jackson, Philadelphia.
84 Present Status of Serotherapy. W. B. Jennings, New York.
85 Management of Pulmonary Tuberculosis. L. Shalet, New York.
86 Modified Drainage for Suprapubic Prostatectomy. G. H. Day, Louisville.
87 Case of Artificial Pneumothorax in Treatment of Pleurisy with Effusion. R. M. Alexander, Wernersville, Pa.
88 Case of Measles Complicating Pregnancy. S. J. Scadron, New York.

September 6, No. 10, pp. 449-500

89 Orthopedics in General Practice. C. Ogilvy, New York.
90 Vaccine Treatment of Typhoid. B. M. Randolph, Washington, D. C.
91 *Foundation of Education. H. J. Mulford, Buffalo.
92 Analysis of Five Hundred Fatal Medical Cases in Tropics, W. E. Deeks and W. G. Baetz, Canal Zone.
93 Cutis-Index Morbi. W. P. Cunningham, New York.
94 Vincent's Angina. L. Green, New York.
95 Rational Treatment of Pustular Skin Diseases. J. W. Fisher, Middletown, Conn.
96 Double Drainage-Tubes (Inner and Outer) for Nares after Submucous Resection of Septum. S. Goldstein, New York.
97 *Three Cases of Acute Gastro-Intestinal Intoxication with Constipation and Suggested Method of Surgical Treatment. R. J. Manion, Fort William, Ont.

91. **Foundation of Education.**—The manner of learning, says Mulford, should begin early, but—teaching, formal teaching, should not. The brain is not ready for real thought before its eighth year, and so, anything requiring thought should be barred until then. Before that we have the primitive brain to consider, and the primitive brain itself considers *only* action. There should be no *formal* schooling for a child under 7 years of age, but the foundation of its education should be begun. That is, we should lay down the right pathways, not forgetting that these pathways come through action. The child under that age should have an active life, but it should be action that is under proper direction. He should not be thrust out into the back yard or on the street to pick up things for himself, mostly undesirable things; his activities should be so directed that he will learn useful things through them. The little child comes into knowledge of the external world through intimate association with it, through contact. That which he learns he learns unconsciously, without effort, and as a matter of fact through constant and everyday association with it. He learns to say "Mamma" through hearing the word many times, day after day. The impulse reaches his brain through the afferent nerve fibers, and, after a sufficient number of these impulses have been received, the motor centers controlling the muscles having to do with speech awake to the consciousness of the word, and, acting on that consciousness, the muscles coordinate and pronounce the word. But, even after the word is pronounced, the centers are not in immediate control of it; their control is not perfect at the first attempt, nor yet at the second. The word impulse is so complicated that it requires many repetitions before it is learned. This, Mulford continues, should be the manner of the acquisition of knowledge by the very young; in that manner should the foundation of an education be laid. Children under 8 years of age should learn, but learning should not be forced on them. The process must be made interesting and understandable from their point of view. Most children, at any age, learn with difficulty under the ordinary school routine, and usually have to be driven to their books. That is because, first, they do not begin in the right way, and, second, because the work is not presented so that they may grasp it. If these children learn anything at all, it is only through sheer memorizing of facts. But it is not the memorizing of bare facts, facts that only are to be repeated parrotlike, that constitutes education. Education is the individual, and, more than the individual; it is the present and the future, the individual and the world. It is the welfare of both that is determined by the foundation of the individual's education, by the development of the child's growing brain.

97. **Gastro-Intestinal Intoxication.**—During the past three years, Manion attended three cases, all fatal, the outstanding features of which were a very acute onset of so severe an intoxication as to cause coma, absolute constipation, vomiting of black material, and death in from one to three days. The constipation was so absolute and the vomiting so intractable as to resemble an obstruction of the bowels, but the antemortem findings in one case, and the post-mortem findings in the other two, revealed no sign of organic obstruction, but only a paralysis of a certain portion of the small intestine, above and below which the bowel was absolutely normal. Despite the fact that the material in the distended, paralyzed portion of bowel could easily be forced in either direction, Nature, even with the assistance of oil, salts, and so forth, was quite unable to overcome the obstruction caused by this paralysis; with the result that the distended portion acted as a reservoir of toxins from which the body absorbed enough poisonous materials to cause ultimately a fatal ending. Taking into account the gravity of this condition, Manion suggests that the treatment should consist of interstitial injections, stimulants, irrigation of bowel and stomach, and strong purgation. But if it were found impossible to satisfactorily evacuate the bowels of the patient, it is the opinion of Manion that a laparotomy would be indicated with the object of forming an artificial anus to drain the distended portion of bowel, which is nothing more or less than a toxic reservoir, absorption from which is gradually killing the patient. The whole operation could be done inside of ten minutes without even the shock of an anesthetic if the patient were unconscious, as he usually is in this condition. And the artificial anus could be attended to after recovery from the acute condition.

New York State Journal of Medicine, New York

August, XIII, No. 8, pp. 407-456

98 Relief of Vesical Obstruction in Selected Cases. H. G. Bugbee, New York.
99 Some Phases of Surgery of Stomach. G. Woolsey, New York.
100 *Medical versus Surgical Treatment of Puerperal Eclampsia. E. G. Zinke, Cincinnati.
101 *Emptying Uterus as Method of Treatment of Puerperal Eclampsia. R. Peterson, Ann Arbor, Mich.
102 Value of Discipline in Care of Sick Child. T. W. Clarke, Utica.
103 Nerves and Nursing Mother. C. A. Frost, Utica.
104 Use and Abuse of Sugar. E. H. Bartley, Brooklyn.
105 Forests and Their Relationship to Eugenics. G. N. Jack, Buffalo.
106 Reflections Concerning Art of Healing. S. Y. Howell, Buffalo.
107 Conservation Treatment of Injuries of Hand. V. D. Bozovsky, Dunkirk.

100. **Treatment of Puerperal Eclampsia.**—Zinke has formulated the following definite plan of treatment for puerperal eclampsia: If the patient has or has had convulsive seizures, 25 drops (15 m. or 1 c.c.) of tincture of veratrum viridi are given hypodermically, and repeated every hour until the pulse is reduced to 60 per minute or less. If within an hour the pulse falls from 150 to 100 per minute only from 10 to 15 drops are injected in the succeeding dose. More than two or three injections are rarely necessary to bring the pulse down to 60. This is the most valuable remedy in the treatment of eclampsia. A copious enema of soap-water serves to wash out the large intestine. The catheter is employed to empty the bladder; the urine is measured and examined. As soon as the patient is able to swallow, a tablespoonful of Epsom salt, or some other saline cathartic, is administered per mouth. Stronger cathartics are given only when the saline proves ineffectual. (By this time, if the patient is not in a hospital, she should, if possible, be taken to one.) Whether the patient is in a hospital or not, immediately after the foregoing treatment has been administered she is given a hot bath or hot pack, preferably the former. Neither the bath nor pack exceeds half an hour in duration. The patient is then rubbed dry and placed in a warm, dry bed. The bath or pack is given not oftener than twice in one day. Ordinarily but one bath or pack is necessary in twenty-four hours.

The only food is milk or broth or both. Water or Fischer's solution may be administered freely. The latter may be given by rectum, or, if the case be an urgent one, intravenously. Chloral, by mouth or rectum, is given if the patient is very restless. Of late Zinke has discarded the use of chloroform and morphin; ether or gas-ether is the anesthetic of choice if operative measures must be employed. If the patient is at the end of the first stage of labor, and then only if the symptoms are grave, forceps may be employed to terminate labor. If the first stage is not complete, or if labor has not begun and the patient has improved under the treatment before mentioned, the case is then left to Nature until the first stage of labor is completed, when forceps may be applied. In cases of anemia, or asthenia from any cause, the normal saline solution or Fischer's solution is given by rectum or intravenously.

With very little variation this has been Zinke's plan of treatment for the last ten years, during which time thirty cases of eclampsia were observed. Four mothers died, 13.3 per cent. Fifteen of the children, 50 per cent., were lost. It is not asserted by Zinke that this mode of procedure will be invariably successful, but his experience impels him to believe that in those cases in which it fails very little could have been expected from surgical intervention. The good results obtained from strictly medical care in these cases far exceed the results accruing from all the surgical means proposed for the relief from this disease.

101. Also published in *American Journal of Obstetrics and Diseases of Women and Children*, August, 1913, and abstracted in The Journal, Sept. 13, 1913, p. 895.

Northwest Medicine, Seattle, Wash.

August, V, No. 8, pp. 209-238

108 Problems for Medical Profession. W. C. Cox, Everett, Wash.
109 New Operation for Radical Cure of Indirect Inguinal Hernia. U. C. Bates, Seattle, Wash.
110 Ultimate Nervous Results of Acute Angulation of Sigmoid and Consequent Fecal Stasis. W. H. Axtell, Bellingham, Wash.
111 Diagnosis of Gastric Cancer. A. R. Lensman, Seattle, Wash.
112 Indications for Interruption of Pregnancy. M. A. Freece, Salina, Utah.
113 Treatment of Hemorrhagic Disease of New-Born: Report of Case. J. B. Manning, Seattle, Wash.

Old Dominion Journal of Medicine and Surgery, Richmond, Va.

August, XVII, No. 2, pp. 57-108

114 Old Days at Old College. W. H. Taylor, Burlington, Va.
115 Case of Addison's Disease. B. R. Tucker, Burlington, Va.

Pennsylvania Medical Journal, Athens

August, XVI, No. 11, pp. 847-930

116 *Isolated Sclerotic Involvement of Mitral Valve. R. N. Willson, Philadelphia.
117 Correction of Nasal Deformities, Particularly Lateral Deflections and Depressions with Obstructing Deviations of Septum. G. M. Marshall, Philadelphia.
118 Intubation. R. W. Bemis, Philadelphia.
119 Two Cases of Nasopharyngeal Polypus in Young Persons Operated for Adenoids. W. R. Butt, Philadelphia.
120 Gas Bacillus Infection. D. Guthrie, Sayre, N. Y.
121 Bronchoscopic Removal of Collar Button after Twenty-Six Years' Sojourn in Lung. C. Jackson, Pittsburgh.
122 Foreign Bodies in Lungs: Report of Two Cases. H. R. M. Landis, Philadelphia.
123 How Can We Make Society Meetings Interesting? W. G. Tillman, Easton.
124 Unethical Ethics versus Ethical Quackery. J. H. Comroe, York.

116. Abstracted in The Journal, Nov. 16, 1912, p. 1816.

South Carolina Medical Association Journal, Seneca

August, IX, No. 8, pp. 200-237

125 Conservation of Nerve and Mental Health. J. A. Hodges, Richmond, Va.
126 Personal Hygiene. F. A. Coward, Columbia.
127 Country Sanitation. J. A. Hayne, Columbia.

Vermont Medical Monthly, Burlington

August, XIX, No. 8, pp. 183-208

128 Effect of Strychnin and Digitalis on Man. D. Marvin, Burlington.
129 Alcoholism and Eugenics. W. L. Wasson, Burlington.
130 New Serodiagnostic Test for Pregnancy (Abderhalden's). C. F. Ball, Rutland.
131 Gleanings from Trip of Medical Globe-Trotter. M. R. Crane, Rutland.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

August, X, No. 116, pp. 337-384

1 *Hereditary Congenital Torticollis. D. M. Greig.
2 Two Cases of Ateliosis. F. P. Weber.
3 Two Successful Cases of Operation for Strangulated Inguinal Hernia in Female Infants of Ages of 22 and 17 Days. R. H. A. Whitelocke.
4 Refraction Work in School Children. J. Allan.

1. **Hereditary Congenital Torticollis.**—The family cited by Greig consists of father, mother and four children, two of each sex. The children's maternal grandmother had a left congenital wry-neck. The mother, an only child, aged 35 years, is the subject of a left congenital wry-neck for which no treatment has ever been attempted. The head inclines to the left, the left ear being approximated to the left shoulder and the face looks toward the right shoulder. The sternomastoid muscles are well developed, though the left is more prominent than the right and the trapezii muscles are not abnormal. The degree of torticollis is slight. She can put her head perfectly straight and without effort, but as soon as her attention to the position is relaxed, her head invariably inclines again toward the left. The father is a normally developed man of the artisan class, perhaps slightly undersized, but healthy. The eldest child is a daughter, aged 10 years, strong, well developed and without peculiarity.

The second child is also a daughter, aged 7 years, but she has a left congenital wry-neck, more marked and obvious than her mother's. The wry-neck in this child was not noticed until she was 6 months old. She had had no illnesses previous to that time, and has had no illness of importance since. Even after the deformity had been admitted its extent was not appreciated until quite recently, when, the child having fallen and cut her head, her hair was shorn to facilitate dressing; the deformity naturally became much more noticeable. There is marked contraction and prominence of the left sternomastoid muscle; the left suboccipital area seems very empty while the right seems fuller than normal, and this fulness appears to be due in great part to the cervical spine, which presents a dextroconvex scoliosis. Otherwise the child is of good physical and of normal mental development and is getting on well at school. The third child, a boy, aged 5 years, is strong, well and healthy, and free from defect. The youngest child is 2 years of age. He has a very marked left congenital wry-neck, presenting conditions exactly similar to those of his sister in appearance and in every detail, however trifling.

British Medical Journal, London

August 23, II, No. 2747, pp. 437-528

5 Port Sanitary Administration: Prevention of Introduction of Infectious Disease. H. Williams.
6 Destruction of Rats in Port of Rangoon. F. A. Fox.
7 Prevention of Tuberculosis E. W. Hope.
8 Functions of Tuberculosis Officer. H. O. West.
9 Necessity of Educating Public in Matters Relating to Public Health. E. W. Hope and H. R. Kenwood.

Clinical Journal, London

July 30, XLII, No. 17, pp. 257-272

10 Arteriosclerosis. W. E. Hume.
11 *Some Interesting Surgical Cases. D. Power.
12 Vasomotor Phenomena as Premonitory Symptom in Rheumatoid Arthritis. J. Lindsay.

August 6, No. 18, pp. 273-288

13 Diagnosis in Abdominal Emergencies. W. Sheen.
14 *Demonstration of Surgical Cases. E. M. Corner.
15 Ionic Medication. E. P. Cumberbatch.
16 Spontaneous Hemorrhages. D. Duckworth.

August 13, No. 19, pp. 289-304

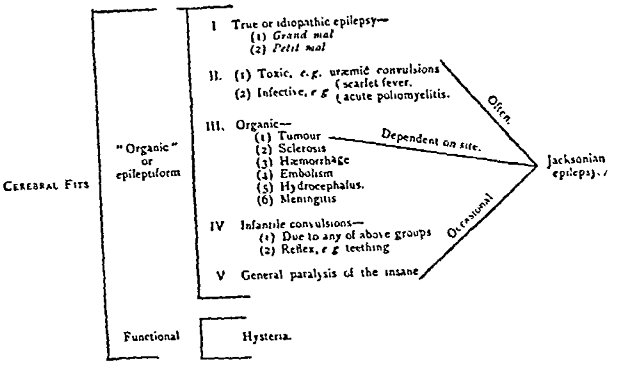
17 Internal Glandular Secretions and Their Influence on Causation and Treatment of Disease. R. M. Leslie.
18 *Three Cases of "Fits." R. A. Fleming.

11. **Surgical Cases.**—Power cites: (1) foreign body in the esophagus; (2) pneumonia simulating abdominal inflammation; (3) acute duodenal perforation simulating pneumonia;

(4) multiple infection of tongue and glands; (5) recurrent spontaneous hemorrhage into the breast (hemophilia?); (6) spontaneous fracture of the thigh secondary to cancer of the uterus.

14. **Surgical Cases.**—Corner cites a case of sarcoma of the femur in a boy 12 years old; a case of granuloma of the jaws; one of tuberculous mediastinal abscess; one of spastic diplegia, Little's disease; deformities after arthrectomy, and two cases of hernia, one with a movable testicle.

18. **Three Cases of "Fits."**—Fleming makes use of the following table in speaking of the pathology of these cases:


CEREBRAL FITS
"Organic" or epileptiform
I True or idiopathic epilepsy—
(1) Grand mal
(2) Petit mal
II. (1) Toxic, e.g. uræmic convulsions
(2) Infective, e.g. scarlet fever. acute poliomyelitis.
III. Organic—
(1) Tumour
(2) Sclerosis
(3) Hæmorrhage
(4) Embolism
(5) Hydrocephalus.
(6) Meningitis
IV Infantile convulsions—
(1) Due to any of above groups
(2) Reflex, e.g. teething
V General paralysis of the insane
Often.
Dependent on site.
Occasional
Jacksonian epilepsy.
Functional
Hysteria.

Dublin Journal of Medical Science

August, III, No. 500, pp. 81-160

19 Clinical Report of Rotunda Hospital for One Year, Nov. 1, 1911, to Oct. 31, 1912. H. Jellett.
20 *Recognition and Treatment of True Idiopathic Epilepsy in Children. J. N. G. Nolan.
21 *Treatment of Dysentery by Injection of Emetine Hydrochlorid. J. H. Thompson.

20. **Idiopathic Epilepsy in Children.**—The management of the child should be based on general hygienic and dietetic lines. Regulated periods of exercise and instruction must alternate with regular periods of rest and repose in Nolan's judgment. Corporal punishment must be absolutely prohibited. All over-exertion and strain, whether mental or physical, must be assiduously guarded against. The usual stimulating dietary of tea and meat had better be abolished, and milk and cereals substituted. Drug treatment had better be avoided at this stage, save the administration of general tonics and necessary aperients. A carefully-regulated life with a purin-free diet and a small daily dose of bromids is the treatment par excellence. The bromids do not require to be given in great quantities or at intervals during the day. The smallest dose which appears to exert a favorable influence over the fits should be taken as the maximum, and this never should exceed 60 grains. The effect is intensified by the full quantity being given at one time. The best time is at night or before rising, depending on whether the patient is subject to diurnal or nocturnal attacks. Plenty of water should be given with the dose, and sufficient laxative to insure a daily evacuation of the bowels. The best adjuvant is the syrup of Virginian prune.

21. **Treatment of Dysentery.**—Thompson's treatment usually was to start off with ʒvi of castor oil and a few minims of tincture of opium; after that had produced its effect he ordered mxx tincture of opium in ℥ss of water, to be followed fifteen minutes later by 30 grains of powdered ipecac, in emulsion. (No food having been taken for some time previously.) This was repeated every four hours. Diet restricted to soup, milk, or albumin water, and the patient rigorously confined to bed. If, after twelve doses there was no improvement Thompson then ordered the saline treatment—

		gm. or c.c.			
℞	Sodii sulphatis	4	66	or	ʒ i
	Acidi sulphurici dil.				♏ x
	Aquae ....ad	16			℥ ss

Misce. Sig. Such a dose every two hours.

This was given till blood and mucus had disappeared from the stool.

Later he resorted to emetine hydrochlorid. First he gave small doses, 1/3 grain, but now he never uses less than ½ grain doses for adults, and sometimes when he gets early cases he injects 1 grain, which practically aborts the disease. He has never found any ill effect following an injection. In mixed dysentery infection—i. e., amebic and bacillary—Thompson finds that injections of emetine, and ℥ss doses of the acid sodium sulphate mixture by the mouth is the most satisfactory method, strict attention always being paid to diet and rest. He has treated about 150 patients with emetine hydrochlorid. In some of these the treatment had no effect whatever, and those, according to Rogers, are of bacillary origin. So, therefore, not only does emetine cure the amebic variety (which constitutes about 85 per cent. of the dysentery in Thompson's district), but it serves for a differential diagnosis for bacillary dysentery, and thus enables it to be quickly treated along the proper lines.

Journal of Obstetrics and Gynecology of British Empire, London

July, XXIV, No. 1, pp. 1-60

22 Study of Forceps. A. Doran.
23 *Some Sequelae of Labor. B. Solomons.
24 *Operation for Prolapse Complicated by Hypertrophy of Cervix. W. E. Fothergill.
25 Hemorrhages into Angiomatous Fibromyoma of Uterus and Atheroma of Uterine Arteries. W. F. Shaw.

23. **Sequelae of Labor.**—Examining 543 primiparae sixteen days after labor, Solomons found that cervical laceration after normal labor is very common, occurring 219 times in this series. If it occurs, and hemorrhage is present, immediate suture should be practiced: if no hemorrhage, the tear should be sewn in two months, or else a routine examination should be made of all women at the end of their child-bearing period, when all lacerated cervices should be repaired. Postpartum retroversion of the uterus, when not fixed back by inflammation, is caused by the dorsal decubitus. The best treatment, therefore, is postural. Solomons urges that every patient should be examined once a month for at least four months after confinement. When non-union of a stitched perineum occurs, a second perineorrhaphy should be done immediately in aseptic cases. Solomons says that no definite dictum can be laid down about early rising until some more statistics are published. In normal clean cases postural treatment and gymnastic exercises are advised.

24. **Operation for Prolapse Complicated by Hypertrophy of Cervix.**—Fothergill uses a single incision for both the amputation of the cervix and the excision of the redundant vaginal wall and has found the results more satisfactory than those obtained by doing the operations separately. The cervical canal is dilated and a circular incision is made round the cervix with a knife. The vaginal wall, the bladder and the parametria are then snipped free with scissors and pushed back from the cervix. The vaginal wall is next incised for an inch or so on either side of the circular incision already made, the new cuts extending directly to the right and to the left. The anterior vaginal wall is now separated from the parametric tissues and from the bladder, and a triangular portion with its apex near the urethral aperture is cut away. The cervix is next amputated, enough being cut away to leave the uterus 3 inches long. The stump of the cervix is now stitched into the posterior part of the incision. The first suture brings together the central point of the posterior limb of the vaginal incision and the mucosa lining the posterior wall of the cervical canal. The second and third stitches unite vaginal wall and cervical mucosa right and left of the first. And so on, until the sides of the vaginal incision come together in front of the stump of the cervix. By this time the newly constructed os is beginning to disappear upward and backward. The lateral edges of the vaginal wound with the subjacent connective tissue are brought together in the middle line from behind forward. The line of suture disappears from view as the later sutures are tied. The perineum is finally repaired as before. Fothergill finds this method of operating convenient both when the elongation of the cervix is mainly supravaginal and also when the elongation mainly affects the vaginal portion.

Lancet, London

August 23, II, No. 4695, pp. 521-606

26 *Tuberculin Treatment. H. Mackenzie.
27 Use of Radium in Malignant Disease. R. Abbe.
28 Preventive and Curative Treatment of Industrial Lead Poisoning. T. Oliver.
29 *Investigations into Relationship of Tarbagan (Mongolian Marmot) to Plague. G. E. Tuck.
30 *Presence of Acetone Bodies in Urine and Their Clinical Significance. J. E. Piper.

26. **Tuberculin Treatment.**—Tuberculin treatment in Mackenzie's opinion is still on its trial. The results of it so far are not brilliant, certainly not convincing. Vaccine treatment, as a whole, is on its trial, and if we except staphylococcus infections, Mackenzie says no more can be said for vaccines than for tuberculin. He has never seen a person who has been cured by vaccines of anything of which he could not get well without. He has yet to see absolute convincing proof that tuberculin treatment by itself will arrest or cure or improve a larger number of cases than would have arrived at the same results without the treatment. Until we have that we must preserve an open mind on the matter. The fact is that tuberculin as a remedy, if it is a remedy, must be put on a far lower plane than many remedies which we possess for the treatment of disease. The most that can be claimed for tuberculin is that it promotes the natural defenses of the body. That is something, but the same can be claimed for fresh air, for good food, for hygiene, for care, for climate, and for all the other weapons which we possess.

Much, in Mackenzie's opinion, remains to be done to prove that tuberculin possesses any very high value as a remedy. Let it be shown, he says, that tuberculous disease in animals can be cured more readily or arrested by means of tuberculin treatment than without. For a number of years Mackenzie used tuberculin in a large number of cases. He has used extract and endoplasm. He has given it orally and subcutaneously and at longer and shorter intervals. He has given it in repeated small doses and in gradually increasing doses. He has used it, he says, because he felt it ought to have a full trial. But after all the trials he has made he still feels uncertain as to the value of tuberculin.

29. **Relationship of Tarbagan to Plague.**—Even though the tarbagan occasionally suffers from plague, Tuck says, the epizootic is never extensive, and the animal does not play nearly so important a rôle in the spread of plague as does the rat. Indeed, its direct relationship to human plague may be considered negligible. Moreover, the mode of living and habits of the tarbagan are very different from those of the rat; for example, while the rat is a more or less domestic creature in close contact with man, the tarbagan is the reverse.

30. **Acetone Bodies in Urine.**—In his ward work Piper found that an attack of pain in the pelvis or abdomen, such as a mild attack of appendicitis or salpingitis, will produce diaceturia. If the attack passes away the diacetic acid will be eliminated in a few days and will disappear at once if pancreatin be administered. If the pain persists, or reappears at short intervals, the diaceturia will persist in spite of the pancreatin, although it will be greatly lessened thereby. If the pain becomes more acute the patient will commence to vomit. The urine of the patient is now examined, and the examiner will say that either the vomiting is due to the acetone or the acetone is due to the vomiting. The suggestion that the error in metabolism was occurring earlier and that oxybutyric acid was exerted instead of acetone is refuted by the fact that diacetic acid will react at a dilution of 1 in 120,000, and surely this percentage at least would be present if oxybutyric acid was formed.

In treating these patients Piper has followed out the two common methods of treating diaceturia as well as one of his own. He treated only patients who had no acetonuria before operation when comparing the three methods, viz., treatment by sodium bicarbonate, by glucose, and by pancreatin—and he found that sodium bicarbonate had little or no effect, that glucose had an appreciable effect, but was simply dwarfed out of existence by the pancreatin. He gave 25 grains again as soon as possible after the operation, and in only one case out of a large number did he find any acetone present, and then only a trace. It is quite possible, he says, that this patient did not get all the pancreatin ordered. In cases of preanesthetic acetonuria, measured quantitatively, he found the amount diminished after operation under this treatment. He tested the pancreatin in all cases and found that it digested starch, although in some cases the process was slow. There was no carbohydrate in the stomach or intestine for it to break down, as the patient had had the usual starvation preparation. To effect this strong and undoubted reaction it must be absorbed in the blood; but what does it do then?

Medical Press and Circular, London

July 30, XCVI, No. 3873, pp. 107-132

31 Puerperal Eclampsia and Its Treatment. J. Veit.
32 Apex-Treatment for Pulmonary Consumption. W. Ewart.
33 *History and Origin of Leukocyte (White Blood-Corpuscle). H. D. McCulloch.
34 Some Aspects of Internal Secretion in Disease. G. R. Murray.
35 Medical History of Brighton. W. A. Hollis.

August 6, No. 3874, pp. 133-160

36 Diagnosis in Respect of Certain Symptoms and Signs in Children. S. Neave.
37 Gifts of Surgery to Medicine. B. Moynihan.
38 *Chronic Mediastinitis: Its Causes, Forms, Symptoms and Treatment. C. Lian.
39 Apex-Treatment for Pulmonary Consumption. W. Ewart.

August 13, No. 3875, pp. 161-186

40 Osteomyelitis in Infants. E. Kermisson.
41 Apex-Treatment for Pulmonary Consumption. W. Ewart.
42 Chronic Mediastinitis: Its Causes, Forms, Symptoms and Treatment. C. Lian.
43 Medical Prognosis: Its Methods, Evolution and Limitations. A. Chauffard.

33. **Origin of Leukocyte.**—McCulloch holds that leukocytes are in no sense of the term blood-cells, and that the expression "white blood-cells" is a misleading anomaly. He believes that they are a part of the lymphoid system.

38. **Chronic Mediastinitis.**—There are two conditions in Lian's opinion in which energetic treatment of mediastinitis is to be instituted. 1. In presence of syphilitic mediastinitis intensive treatment is called for, either with soluble mercurial salts, especially the cyanid of mercury, by the intravenous method, or with insoluble salts (especially calomel) or the arsenicals in prudent doses. The influence of the treatment is remarkable at the period of gummatous infiltration and that of invasion of the mediastinum; it is less efficacious when the mediastinitis is fully constituted. 2. In mediastinopericarditis freeing the heart by Brauer's method has yielded good results in some instances. It is indicated in cases of mediastinitis with pluricostal systolic retraction at the apex if the myocardium is not exhausted. In tuberculous mediastinitis we have recourse to general antituberculous measures, but in most cases we shall only be able to employ palliative means and first and foremost patient must be placed at rest under hygienic conditions of life, because this alone often has an excellent influence.

South African Medical Record, Cape Town

May, XI, No. 10, pp. 173-198

44 Leprosy in South Africa, up to Establishment of First Leper Asylum, Hemel en Aarde. R. Morrow.
45 Administrative Side of Leprosy Question. C. F. K. Murray.

June, No. 11, pp. 199-226

46 Critical Review of Recent Experimental Leprosy Research. H. Bayon.

Annales de l'Institut Pasteur, Paris

July, XXVII, No. 7, pp. 501-596

47 Diseases of Microbian Origin in Economic Plants. (Altérations microbiennes des organes charnus des plantes.) L. H.-Merck.
48 Dialysis of Maltase. W. Kopaczewski.
49 Nephritis and Cirrhosis of the Liver in Rabbits Kept on a Milk Diet. (Néphrite et cirrhose hépatique chez le lapin soumis a l'alimentation lactée.) L. Martin and A. Pettit.
50 *Anaerobes in Typhoid Fever. J. Loris-Melikov.
51 Properties of Perioxydase. (Quelques propriétés nouvelles du catalyseur dit "peroxydase." Rapprochement entre son action et celle des nitrites.) J. Wolff.
52 Causes of Error and Technic to Avoid Them in Estimating Percentage of Glucose in Stools and Other Physiologic Mediums. (Technique de dosage du glucose dans les matières fécales.) L. H. Dejust.

53 *The Spirochetes of Syphilis in the Brain in General Paresis. (Le tréponème dans le cerveau des paralytiques généraux.) C. Levaditi, A. Marie and J. Bankowski.

50. The Anaerobes in Typhoid Fever.—Melikov has found in the stools of typhoid patients a bacterium which he thinks has not been previously described, an anaerobe; he calls it the satellite bacillus. He never found it in any but typhoid stools, and he believes that it is responsible in a large part for the intestinal lesions in typhoid. He conceives of typhoid as a syndrome combining two distinct processes, one of the septicemic type, due to the action of the true typhoid bacillus which lives in the general circulation or in the blood-producing organs; the other, a process of necrosis, occurring exclusively in the portions of the intestines which contain no air, due to the action of a strictly anaerobic, powerfully proteolytic bacillus, the *B. satellitis.* Usually these two processes develop together, both microbes associated in the intestines; then one or the other gets the upper hand and we have the toxic element predominating or the intestinal element.

53. Spirochetes in the Brain in General Paresis.—Examination of the brain of nine persons who had died from cerebral hemorrhage from one to fourteen months after the onset of progressive paralysis showed spirochetes in all but one case. In all the positive cases the men had succumbed to a cerebral hemorrhage. In three cases the spirochetes were as numerous as in a primary lesion. See also Editorial, page 776.

Archives Mens. d'Obstétrique et de Gynécologie, Paris

August, II, No. 8, pp. 49-96

54 Obstetric Pseudoluxation of the Shoulder in the New-Born. (De la disjonction diaphyso-épiphysaire traumatique de l'extremité supérieure de l'humérus chez le nouveau-né.) E. Bonnaire and G. Ecalle.

Bulletin de l'Académie de Médecine, Paris

July 29, LXXVII, No. 29, pp. 143-179

55 Tuberculosis in Dogs and Cats. (Sur la tuberculose des carnivores domestiques.) Cadiot.

Journal de Chirurgie, Paris

August, XI, No. 2, pp. 141-268

56 *Ligation of the Hypogastric Artery in Abdominal Hysterectomy for Cancer. R. Proust and A. Maurer.
57 Apparatus for Inhalation of Chloroform. (Nouvel appareil pour l'anesthésie chloroformique.) P. Fredet.

56. Ligation of Hypogastric Artery in Abdominal Hysterectomy.—Proust and Maurer used to ligate the hypogastric artery only when the women were corpulent or other conditions rendered the hysterectomy unusually difficult. But it proved to have so many advantages that they now do it systematically as the first routine step. It facilitates the search for the ureter, shortens the operation as a whole, reduces the loss of blood, and facilitates the removal of the uterus. In order to obtain all these advantages the hypogastric must be ligated beyond the ureter, not inside of it, the ureter being drawn inward out of the way. The ligature is applied to the hypogastric artery not through a separate incision in the peritoneum, but in the upper part of the principal incision, and the point where it is applied must be at farthest not over 2 cm. from the bifurcation. They give seven large illustrations showing the exact technic as they have applied it in eight cases of uterine cancer.

Journal de Médecine de Bordeaux

August 3, LXXXIV, No. 31, pp. 495-508

58 *Poisoning from Anilin Dye in Shoes or Stockings. (L'empoisonnement par les chaussures noircies à l'aniline.) Creyx.

August 17, No. 33, pp. 525-540

59 Case of Mesenteric Thrombosis. G. Drouin and A. Parcelier.
60 Care of Surgical Instruments. (Des soins à donner aux instruments de chirurgie.) W. Dubreuilh.

58. Poisoning from Anilin Dyes in Footwear.—In one case a healthy young man wore a pair of russet shoes which had been dyed black and were still not quite dry. In two hours he became livid, with extreme cyanosis, the lips bluish, the ears purple, the nostrils retracted; the respiration was 29, the pulse, small but regular, was 120 and the skin was chilly, but there was no nausea, dizziness, syncope or tendency to collapse. The urine was blackish but none passed after the first hour. The discovery of the newly blackened shoes in a corner of the room where the young man had tossed them on his return home in the above condition, three hours after he had put them on, cleared up the diagnosis. The symptoms soon subsided. In a second case the young man had put on the newly dyed shoes without socks and started out on his bicycle. In fifteen minutes he was seized with nausea, and fell in a syncope from his wheel. He was picked up in serious collapse with intense cyanosis of the face, respiration 42, pulse filiform, the heart sounds dull. After four hours he passed a blackish urine and in another hour the symptoms began to abate but the weakness persisted for three days, during which period the young man was incapable of the least physical or mental effort. Creyx' third patient was a woman who grew pale and dizzy during the afternoon on several occasions. She went at once to bed each time and the symptoms subsided. She finally discovered that the attacks coincided with the wearing of green stockings, and they never recurred after she had discarded these stockings. In 1910 Landouzy reported ten cases of similar poisoning from russet shoes dyed black, all in children. He experimented on rabbits and found that the intact skin readily absorbs the anilin dyes; the animals died when absorption was through an opening in the skin. Heat favors the absorption. Mongour in 1908 reported a case in which the symptoms from the poisoning proved severe and lasted a long time. Creyx comments on the rarity of such phenomena considering the common use of the anilin dyes. The shoemaker who had dyed the shoes in the first case he reports stated that he had used the same dye on hundreds of other shoes, in his own family among others, and never a suggestion of trouble had been noted among the other users. The dye consisted of anilin black in anilin oil. The bibliography on the subject is appended.

Presse Médicale, Paris

August 2, XXI, No. 63, pp. 633-644

61 Experimental Cancer. A. Contamin.
62 *Treatment of Weakness of the Pulse. (Traitement des hyposphyxies.) A. Martinet.
63 *Local Disinfectants Needed in Diphtheria. (Action du sérum antidiphthtérique médicinal sur le bacille diphtérique.) P. J. Ménard.

August 6, No. 64, pp. 645-652

64 Diagnostic Importance of Examination of the Stools. (La coprologie usuelle. Son interprétation.) R. Goiffon.
65 Echinococcus Cyst of the Greater Omentum. (Kyste hydatique primitif.) A. Ferrer.

August 9, No. 65, pp. 653-668

66 Polycythemia with Ascites. (Erythrémie avec ascite, phlébite de la splénique et thrombose gastro-épiploique.) A. Chauffard and J. Troisier.
67 *Spontaneous Regeneration of Tissue to Close Defects Favored by Position in which Parts are Held. (L'autoplastie spontanée par extension graduelle des tissus, grace aux attitudes permettant la réunion immédiate.) H. Morestin.
68 Tumors Simulating Branchiomas. (Faux branchiomes.) P. Masson.
69 Cesarean Section. (Comment conçoit-on actuellement en France la technique de l'opération césarienne abdominale.) C. Jeannin.

August 13, No. 66, pp. 669-676

70 *The Prognosis. (Le pronostic médical. Ses méthodes—son évolution—ses limites.) A. Chauffard.

62. Weakness of the Pulse.—Martinet's extensive research on the connection between the viscosity of the blood and the blood-pressure was summarized in these columns May 31, 1913, p. 1746. If the blood is less fluid than normal while the blood-pressure is normal or below normal, the pulse will be persistingly weak. This hyposphyxia syndrome, as he calls the persisting weakness of the pulse, is characterized by a tendency to cold hands and feet, congestion in the liver, varices, and various subjective cardiovascular disturbances. Insufficiency of certain of the ductless glands is a contributing or causal factor, helping to maintain a vicious circle. In the present article he outlines the treatment which, he declares, is both rational and effectual. The trouble is not a morbid entity but merely a process of pathologic physiology, a functional disturbance and not a lesion, and the aim is to correct or compensate the defective functioning, gradually leading the organs involved back to normal functioning. The first step is to stimulate the circulation, and for this we have (1) drugs, strychnin and spartein, epinephrin or hypophysis extract, given separately, associated or alternating; (2) muscular exercise, ranging from friction, massage and passive exercises, active movements in the reclining position, gymnastic exercises with elastic resistance, up to walking and climbing; (3) subcutaneous injection of oxygen, which, he says, has a marked stimulating influence on the circulation while the viscosity of the blood declines. The subcutaneous injection of oxygen is the most powerful means at our command, he reiterates, to act on hyposphyxia.

The digestion is almost invariably defective in patients of this class, and systematic stimulation of the digestive glands is an important factor in treatment. His method for this is to have the reclining patient half an hour before meals take a wineglassful of tepid Vichy water and twenty minutes later a few drops of some bitter stomachic. This prepares the stomach for the meal and stimulates the gastric glands. During the meal the patient takes a little of some good preparation of pepsin and two hours after the meal a tepid aromatic infusion of pancreatic and duodenal extracts, including the trypsin, diastase and steapsin. This organotherapy is to be brief; it only aims to tide the patient along until the glands do their work properly. If kept up too long it would be injurious as it might deaden the secretion reflexes. He thinks it is advisable to alternate the subcutaneous epinephrin and hypophysis extract treatment with ovarian and thyroid treatment, individualizing according to the indications and the responses to the various measures applied.

To the objection that the above represents a very complicated course of treatment, he replies that the trouble that is being treated is very complex. It requires systematic permanent measures, alternating transient measures, plus various accessory measures. After ten days he changes from the subcutaneous stimulants for the cardiovascular system (strychnin, spartein, epinephrin, hypophysis extract) to the pluriglandular organotherapy and back again, keeping up for several weeks the measures to act on the digestion or until they are no longer needed. Besides the oxygen, or in its place, iodin or arsenic may also prove useful. Treatment along these lines has restored many patients to complete health when before for months or years their vitality had been at a very low ebb and nothing seemed able to lift them out of their debility. In one case a thin, weak woman of 30 had a differential blood-pressure of 1.5; viscosity 5.2, and extreme atony of the stomach and bowels. She gained 22 pounds in five months and 11 more by the end of the year under this treatment, while the differential pressure rose to 4.5; the viscosity dropped to 4.5, and her digestion became normal. She has resumed an active life and regards her present condition as a resurrection.

When the hyposphyxia is congenital and due to general imperfect development of organs, adults are improved but not to such an extent as is liable under other conditions; but children develop under it into more normal conditions. For three women patients the above course of treatment did not bring the expected improvement and the Wassermann test disclosed the unsuspected fact that syphilis was probably responsible in these cases for the disturbances.

63. **Local Measures in Treatment of Diphtheria.**—Ménard reports research in which he found that diphtheria antitoxin seems to be a particularly favorable culture medium for diphtheria bacilli. Both in the test-tube and in animals, the bacilli thrived particularly well in a number of makes of antitoxin. He found it possible to cultivate the diphtheria bacilli for months in the antitoxin, although they lose some of their virulence and some of their staining properties. The facts observed indicate the necessity for the use of local disinfectants as adjuvants to general antitoxin treatment in diphtheria.

67. **Autoplastic Regeneration of Tissues to Close Defects.**—Morestin gives a number of illustrations to show the fine results that can be attained in the healing of a wound in the bend of the elbow or thigh or back of the knee if the limb is fastened in such a way as to coaptate the tissues enough to close the gap. Sound, healthy tissue does not retract and cause deformity; it is the cicatricial tissue that distorts. Consequently if the sound tissues can be brought so close together that there is no place left for cicatricial tissue to develop, the wound will heal without the slightest retraction and the healthy skin will stretch in time to restore perfect functioning, once the lips of the wound have been soldered together by linear healing. One of his illustrations shows a vast defect left by excision of a lesion in the front of the elbow. By bending the arm until the wrist nearly touched the shoulder, it was possible to coaptate the lips of the wound, and it healed with a linear scar. When the healing was complete it proved an easy matter to gradually stretch the skin by extending the arm a little more each day, until its full use was restored. This idea of applying hyperflexion to the region seems to be contrary to all we have been taught in respect to the healing of defects in the skin over joints, but experience is proving the correctness of his premises and the advantages of this method of preventing deforming cicatrization after burns and other lesions leaving extensive loss of substance. He reports six cases to illustrate the advantages of the method. One of the patients was a young woman and the large defect was on the back of the shoulder. The arm was twisted backward and immobilized in that position. This permitted coaptation of the lips of the wound and healing with a linear scar scarcely to be detected in the illustration. The skin is now healthy, supple and movable over the entire shoulder.

70. **The Prognosis.**—This was one of the main general addresses of the recent international medical congress.

Semaine Médicale, Paris

August 13, XXXIII, No. 33, pp. 385-396

71 *Subcutaneous Symphyseotomy. R. de Bovis.

August 20, No. 34, pp. 397-408

72 Partial Atrophy of the Shoulder Muscles in Erb's Juvenile Myopathy. F. Rose.

71. **Subcutaneous Symphyseotomy.**—De Bovis reviews what has been written on this subject, emphasizing that the pelvis is not permanently enlarged by the operation. The amazing simplicity of the subcutaneous technic, the aseptic conditions and the freedom from complications and mishaps, will render this operation the one of choice in management of contracted pelvis if time confirms its advantages and if no tendency to prolapse of the bladder is left. The operation is of too recent date as yet to guarantee against a possible tendency later to prolapse of the bladder in the cleft.

Archiv für Verdauungs-Krankheiten, Berlin

August, XIX, No. 4, pp. 409-500

73 *Simple Test for Absorption of Fat. (Zur Methodik der Fettresorptionsprüfung.) A. Neumann.
74 Gastro-Intestinal Indicanuria. K. Frenkel and R. Franco.
75 *Significance of Urobilin and Urobilinogen in the Body Fluids. (Welche Bedeutung hat der Nachweis des Urobilinogens gegenüber dem Nachweise des Urobilins?) W. Hildebrandt.
76 Causes and Treatment of Vomiting in Pregnancy, in Tabes and in Seasickness. (Neue Gesichtspunkte für die Aetiologie und Therapie des Erbrechens in der Gravidität, bei Tabes und in der Seekrankheit.) W. Sternberg.
77 *Influence on Blood Production of the Albumin in the Food. (Einfluss des Nahrungseiweisses auf die Bluterneuerung.) F. W. Hopmann.
78 Diagnostic Significance for Cancer of Special Form of Diarrhea. (Zur diagnostische Bewertung der "Spritzer" genannten diarrhoischen Entleerungen.) G. Graul.

73. **Test for Absorption of Fat.**—Neumann states that it is possible to trace the absorption of fat in the gastro-intestinal tract by the appearance of fat in the blood. Of the various methods for determining the presence of fat in the blood he thinks the simplest, easiest and most reliable, as it certainly is the most rapid, is the examination of the blood with the ultra-microscope, the dark field illumination. He examined the blood in this way from 120 patients after abstention from fat for a day and the next morning a test-meal of a roll, butter and tea. The blood was then examined at hour inter-

vals. Sometimes in an hour after the test-meal the blood showed the particles of fat; normally the number of the fat particles in the blood rapidly increases for a time and then rapidly subsides. The fat in the blood represents the complicated work of the gastro-intestinal tract in secretion, motor functioning and absorption. If the motor functioning can be estimated separately, then it is easy to determine the actual value of the two other factors. If motor functioning and secretion are normal and yet no fat appears in the blood after the normal period, the absorbing function must be at fault. He gives the blood-fat findings as compared with the roentgenoscopic findings in six cases, emphasizing anew in conclusion the advantages of this method of testing the function of absorption in the digestive tract.

75. **Urobilin from Diagnostic Standpoint.** — Hildebrandt declares that estimation of the urobilin in the urine, stool, bile, in exudates and in transudates has great significance both qualitative and quantitative. The aim should be, he says, to determine the amount of total urobilin, including all its precursors; there is no sense in estimating separately the urobilin and the urobilinogen. He oxidates all the urobilinogen present in the fluid to be examined, transforming it into urobilin. He gives the technic with which this is easily accomplished in twenty-four hours, and warns that the test for *urobilinogen* is liable to prove misleading unless it is applied immediately after the urine has been voided.

77. **Influence of Albumin on Regeneration of the Blood.**— Hopmann concludes from his research that the albumin in the food is the normal stimulator of the new production of red corpuscles. The more albumin in the food the more reds are destroyed and the more new ones produced. He says that each gram of nitrogen ingested corresponds to about that same amount of reds destroyed and newly produced. Too much albumin in the food fatigues or exhausts the blood-producing organs, and he is convinced that this is the cause of many forms of anemia. In anemia and also when too many reds are being produced, the intake of albumin should be restricted to the limit at which there is neither abnormally high or abnormally low elimination of pigment. He adds that the danger of excessive intake of albumin in chronic and acute anemias consists on the one hand in further exhaustion of the sources of the reds in the red bone marrow and on the other hand the albumin modifies the epithelium. This entails a constitutional anomaly which he regards as the cause for the development of malignant tumors. He gives the tabulated details of the metabolic findings in five cases to sustain these views, showing the influence of ingestion of a given amount of meat. The effect of the albumin on the epithelium he estimated by the amount of epithelium thrown off on a certain area in the back and in the urogenital canal under given conditions.

Beiträge zur klinischen Chirurgie, Tübingen

LXXXIV, No. 3, pp. 499-703

79 *Fat Implants as Filling for Cavities in Bones. (Freie Fetttransplantation in Knochenhöhlen.) E. Klopfer.
80 Cases. W. Müller.
81 islocation of the Semilunar Cartilage. des Kniegelenkspaltes bei vollständiger Verlagerung des Meniscus.) E. Schwarz.
82 Pigmented Giant-Celled Xanthosarcomas on Hand or Foot. W. Hartert.
83 End-Results of Operative Treatment of Incarcerated Femoral Hernias. (Operative Dauerresultate von eingeklemmten Schenkelhernien.) H. Rosenfeld.
84 Physiologic and Pathologic Importance of the Omentum. (Bedeutung des Netzes in physiologischer und pathologischer Beziehung.) W. Gundermann.
85 *Fatal Postoperative Pulmonary Embolism. (Studien über obturierende Lungenembolie als postoperative Todesursache.) G. Petren

79. **Fat as Filling for Bone Cavities.**—Klopfer gives an illustrated description of eight cases in which he filled up the cavity left after excision of an extensive osteomyelitic or tuberculous focus in a long bone or bone of the face. The implant heals in place without complications in an aseptic cavity. It heals likewise in place in an infected cavity, but a fistula is liable to develop, delaying healing a little. In the three aseptic cases healing was complete in seventeen, twenty-eight and sixty days. The others still had a small fistula when healing was otherwise complete. The fat implant seemed to shorten the time required for the healing, and the after-care was much simplified by the immediate suture of the wound thus rendered possible. The subcutaneous adipose tissue was taken from thigh or buttocks, aiming to fill the bone cavity entirely, thus tamponing it with the fat tissue so there would be *no hemorrhage.* The size of the flap ranged from 1.5 to 20 cm. in length by 2 or 4 cm. in width. In two of the infectious cases some particles of fat were expelled through the fistula. It is too soon to pass definite judgment on the method but Klopfer's *impressions to date* are quite favorable.

81. **Radioscopic Sign of Dislocation of the Semilunar Cartilage.**—Instead of the normal even light space between the articulating surfaces, they are *seen to* be in close contact on the affected side and spread farther apart than normal on the *other side. Investigation* shows that the internal semilunar cartilage has been pushed entirely out of place, possibly up into the space between the condyles. When roentgenoscopy reveals this shortening of the gap and subluxation of the meniscus it calls at once for restoration of the meniscus to its proper place. Three cases in which this was successfully done are reported.

85. **Fatal Postoperative Pulmonary Embolism.** — Petren reviews the fifty-seven cases of fatal pulmonary embolism at Lund during 1897-1911; all but twelve followed an operation. He compares the details of these cases with 439 fatal postoperative cases that have been reported from various clinics during the last fifteen years. The majority followed abdominal operations: thirty-eight in his forty-five cases and 366 in the 439 on record. It is remarkable that operations on the head, limbs and upper thorax are so seldom followed by embolism. He tabulates all this material under a number of *headings and summarizes his own cases.* The figures show that fatal pulmonary embolism occurs in about 1 per cent. of all operations for *uterine myoma and cancer; only half* as often, 0.5 per cent., after other laparotomies, and only 0.3 per cent. after appendectomy. Age and sex do not seem to influence its incidence, nor the general condition as a rule, although changes in the cardiovascular system evidently cooperate. But it has sometimes occurred in robust, sound patients after an insignificant herniotomy. In half of his own cases the thrombus developed first in an iliac or hypogastric vein and generally on the left side. In six appendicitis cases the primary thrombus was in the left hypogastric vein in five; in none of the appendicitis cases was the thrombus on the right side. The evidence seems to show that the primary thrombus is rarely directly connected with the field of operation; scarcely ever with the *surgical laparotomies*, only exceptionally after hernia, bladder and perineum operations and in less than half of the gynecologic laparotomies.

In his own experience two-thirds of the fatalities occurred between the fourth and fourteenth days after the operation; three puerperal cases the eighth and ninth days, and four the thirteenth to the twentieth. If there are no signs of pulmonary infarct or embolism during *the first two* weeks, the chances are against its developing later. Petren's experience indicates further that slight fever without discoverable cause should warn of impending thrombosis. In 20 per cent. of his cases, straining at stool, change of position in changing dressings, driving in a cab, or other physical strain could be incriminated in bringing on the embolism. In the *other* cases no contributing cause could be discovered. Infection is comparatively rarely a factor. The main factors, he thinks, are defective composition of the blood and poor circulation and heart action. These factors should be combated in prophylaxis, improving the blood, stimulating the heart, preventing loss of blood and promoting the circulation by active and passive exercises of the legs in bed, change of position and light massage of the legs. In only seven of his total fifty-seven cases were conditions such that operative extraction of the embolus could have been applied with any chance of success.

Berliner klinische Wochenschrift

August 11, L, No. 32, pp. 1465-1508

86 Vaccine Therapy of Complications of Gonorrhea. (Behandlung der Komplikationen der Blennorrhagie mittels der Besredka'schen Methode der sensibilisierten Virus-Impfstoffe.) L. Cruveilhier.
87 *Treatment of Blood Diseases. (Zur Klinik der Hämatologie.) H. Strauss.
88 *Palpation of Gastro-Intestinal Canal. (Ergebnisse der topographischen Gleit- und Tiefenpalpation des Verdauungsschlauches.) T. Hausmann.
89 Clinical Importance of Occult Spina Bifida. E. Bibergeil.
90 Care after Appendectomy. Sorge.

87. **Hemolytic Jaundice.**—Strauss reports a case in which the chronic acholuric jaundice was associated with severe gout of the familial type. In another case the hemolytic jaundice in a man of 31, had existed since the age of 12 when it developed after pneumonia. All his brothers and sisters had had jaundice at birth. This is the only case in Strauss' experience in which the spleen was not enlarged. Lereboullet found no changes in the spleen and liver in four of his twenty cases of simple chronic jaundice. In the others the spleen alone was enlarged in five cases, the liver alone in three and in eight both were abnormal. Strauss emphasizes the importance of learning to distinguish between the cases in which the spleen is involved in the production of the trouble and those in which the enlargement of the spleen is merely secondary. Possibly Umber's sign of a splenotoxic destruction of albumin may prove the clue when complicated metabolic research is possible. He gives the findings in the above cases with considerable experimental research. In some of the cases there could be no doubt that the spleen was acting as a kind of slaughter-house for red corpuscles.

In four of his six cases there was pronounced habitus asthenicus. The combination with gout in one case suggests that possibly cholesterin might be used in treatment of the hemolytic tendency, but the experiences to date with cholesterin treatment of severe anemia have not given encouraging results. In another case the blood-producing apparatus seemed to have become exhausted after a gastric hemorrhage from an ulcer, and nearly three years later the anemia was still marked without signs of regeneration of the blood. The hemoglobin ranged from 21 to 29 and no therapeutic measures seemed to influence it, not even thorium. In a case of myelogenous leukemia in a previously healthy man of 60, the leukocytes dropped from 271,000 to 151,000 under forty-five days of benzol treatment. Then two intravenous injections of thorium were given with a three weeks' interval and the whites dropped to 62,000 while the spleen subsided in size.

88. **Palpation of the Gastro-Intestinal Tract.**—Hausmann has made a special study for years of this subject, and states that it is thus possible to map out the different parts of the digestive tract all except the loops of the small intestine. The main point in this topographic sliding and deep palpation is to avoid force. The palpation must be applied gradually and insidiously, proceeding rhythmically, synchronously with the breathing, during the phase of expiration, when the abdominal walls are relaxed. During inspiration the finger must keep still. It is impossible to palpate in this way unconscious patients as they do not breathe normally. By observing scrupulously this principle of stopping all palpation during inspiration, there is no danger of injuring the abdominal walls; the finger tip irritates the abdominal walls only when it manipulates them when they are stretched. The aim is to outline the organ lengthwise and then palpate transversely across it. An organ which we are unable to distinguish from its surroundings, and thus cannot feel, becomes evident to the sense of touch when it slides out from under the finger. The palpation is done systematically from right to left and from above downward. The stomach and large intestine are most readily palpable and being fastened at both ends can be easily located. The interpretation of the findings is facilitated by the preceding palpation of the kidneys, liver and spleen to aid in mapping out the palpation findings. With this topographic palpation displacements and tumors can be located with ease by the practiced fingers, and it often renders Roentgen-ray examination superfluous. Among the interesting points he has learned by this method is that the epigastric pain of an ulcer is due to tenderness in the spine behind, below the greater curvature, and it occurs not only with ulcer but with visceral neuroses and gall-stones. As a rule, he says, tender points are seldom useful in diagnosis of a lesion in an organ unless they can be compared with a symmetrical point on the other side. Tenderness on one side is more liable to be due to some organ; on both sides to some neurosis. Pain at McBurney's point is in reality due to irritation of the psoas muscle or nerves or lymphatics lying on it. This muscle can be made more prominent by lifting the leg, extended at the knee. Tenderness at different segments of the psoas shows whether the trouble is in the kidney region or in the region of the genitals or of the appendix. It is characteristic for the kidney region that the upper part of the psoas is tender as well as the lower. Spontaneous movability of the stomach, etc., is easily revealed by this deep palpation. The necropsy findings may fail to confirm the findings during life owing to this spontaneous movability of organs.

Correspondenz-Blatt für Schweizer Aerzte, Basel

August 9, XLIII, No. 32, pp. 993-1024

91 Benefit from Tincture of Opium in Treatment of Diabetes. A. Preiswerk.

Deutsche medizinische Wochenschrift, Berlin

August 7, XXXIX, No. 32, pp. 1537-1576

92 *Dietetic Treatment of Constipation and Diarrhea. H. Strauss.
93 Tuberculous Pericarditis. (Tuberkelbazillenpericarditis.) C. Fromberg.
94 *Thrombosis of Splenic and Portal Veins. G. Goldmann.
95 *Tardy Ophthalmia Neonatorum. (Zur Kenntnis der Einschlussblenorrhoe der Neugeborenen.) R. Sussmann.
96 Chronic Appendicitis. (Zur Pathogenese der sogen. "chronischen Blinddarmentzündung.") R. Dobbertin.
97 *Acute Non-Gonorrheal Orchitis and Epididymitis; Four Cases. H. Stroink.
98 *Tardy Injuries from Roentgenotherapy. (Spätschädigungen der Haut und innerer Organe nach therapeutischer Röntgenbestrahlung.) H. E. Schmidt.
99 Source of Error in Bacteriologic Technic. (Eine Fehlerquelle bei der Antiforminmethode.) A. v. Lehmann.

92. **Dietetic Treatment of Constipation and Diarrhea.**—Strauss excludes from this discussion of the subject the cases in which the trouble is a weakness in defecation. He is convinced that spastic conditions are frequently responsible for constipation but that they usually have some local lesion as a contributing or causal factor. Another factor of great importance is the special segment of the intestine involved. In twenty-nine cases of chronic constipation, he found isolated stagnation of feces in the cecum in six; in the rectum and sigmoid flexure in eleven, and in the colon in twelve. These different localizations require different diets. Stagnation in the cecum requires a diet free from cellulose. Stagnation at the sigmoid flexure is scarcely amenable to dietetic measures. The aim in treatment of constipation is to stimulate peristalsis and increase the water content of the feces. The former indication is met by apple sauce, and other stewed fruits, fruit juices and fruit jellies; they act mainly by inducing carbohydrate fermentation in the intestines. Also buttermilk, sour milk, whey and the free use of lactose to sweeten lemonades, etc., honey and levulose. A certain amount of fat, especially in the form of tart sauces, mayonnaise, etc., seems to influence peristalsis favorably. To increase the water content of the feces, jellies made of agar are particularly useful. He rinses 5 gm. of agar in cold water, then soaks it in hot water and boils it in 400 c.c. of water until it is clear, then strains through gauze and flavors with white wine, sugar and lemon peel, coffee, chocolate cream or egg yolk and sets aside to cool. Much ballast makes greater demands on the work of the intestines; it is better therefore in dietetic treatment to aim rather at increasing the fluid content of the stool. In some cases a glass of cold water fasting, in others coffee or smoking may stimulate peristalsis, and these factors should not be neglected. In some cases, especially those with a neurotic element, abstention from meat for a time may be useful. With chronic diarrhea the diet should be arranged to spare the intestines as much as possible but one must be aware of the danger of not giving sufficient nourishment. Of fundamental importance in chronic diarrhea is the preparation of the food,

thorough cooking and straining through a hair sieve. It must not be forgotten that patients with a tendency to diarrhea are peculiarly sensitive to cold, even in the food. With alternating constipation and diarrhea, treatment should generally be addressed to the former. When the trouble in the intestines is located in the small intestine, control of the stool is indispensable as a guide to diet. The least error in the diet here is liable to bring on a relapse which will undo in a few days all that has been gained in months of treatment. On the whole, dietetic treatment of chronic diarrhea is a difficult task but in many cases results are highly gratifying. In few fields of dietetics are the results of individualization so unmistakable as here.

94. **Thrombosis of the Splenic and Portal Vein.**—Goldmann's patient was a man of 28, with symptoms suggesting Banti's disease—gastric hemorrhages and anemia at first and later the typical Banti syndrome. Necropsy revealed thrombosis of the portal and splenic vein traced to endocarditis with an infarct in the spleen nine years before the fatal outcome.

95. **Non-Gonorrheal Ophthalmia Neonatorum.**—Sussmann examined seventy-two infants with ophthalmia and found twenty-four cases in which the Prowazek-Halberstädter inclusion bodies were found in the conjunctival secretion; in two cases there was mixed infection with gonococci. The incubation period in twenty cases was two days in one, five days in one, six days in two, from seven to nine days in fourteen, fourteen days in one and fifteen days in one. The inclusion-bodies virus has therefore a longer incubation than the gonococcus, and it is probable that all the tardy cases of ophthalmia neonatorum are due to this cause. The secretion also differs from that with the gonococci, there is more tendency to hemorrhage, the course is more protracted and the cornea remains intact. Simple catarrh of the conjunctiva in the newborn is not of this character. He was not able to detect any connection between the cases and the trachoma of adults.

97. **Non-Gonorrheal Orchitis and Epididymitis.**—Stroink encountered several cases last year of inflammation of the testicle, primary or secondary to parotitis. By puncture and cultivation of the germs found he was able to obtain material for vaccine therapy. He also thus established that the *Bacillus fluorescens non liquefaciens* is able to set up disease of this kind.

98. **Late Injury of the Skin and Internal Organs after Roentgenotherapy.**—Schmidt warns that the new era of intensive dosage of the hard rays is liable to be followed by a crop of serious injuries of the deep organs as well as of the skin. He thinks the method is scarcely justified except for inoperable cancer of the cervix. He knows of instances in which after application of large doses of the hard rays, even filtered, after an interval of months up to a year and a half from the close of the Roentgen-ray treatment ulceration developed without there having been any erythema at the time or atrophy of the skin later. Irritation from without and unfavorable conditions for the circulation, as in the leg, favor the tardy ulceration and there is a possibility of trouble from this source in the deep-lying organs.

Medizinische Klinik, Berlin

August 10, IX, No. 32, pp. 1277-1316

100 Surgery of the Pancreas. Habs.
101 Kidney Calculi. (Zur Pathologie und Therapie der Nierensteinerkrankung.) W. Karo.
102 *Dread Neuroses and Vasomotor Disturbances. G. Flatau.
103 Diet at Health Resorts. (Kurgemässe Diätetik in deutschen Badeorten.) C. Pariser.
104 Influence of Thermal Douche Massage on the Elements of the Urine. E. Rothschuh.
105 Control of the Heart Functioning During Courses of Thermal Baths. J. Havas.
106 Examination of the Blood During Courses of Radium Emanations. (Blutuntersuchungen bei den verschiedenen Methoden der Radiumemanationstherapie.) J. Kemen.

102. **Dread Neuroses and Vasomotor Disturbances.**—Flatau's patients were all women in the two groups he here describes. In the first group the neurosis developed with accompanying urticaria, dyspnea, palpitations and dermography. The hands and finger joints and later the knee swelled up with the dread neurosis in one case, in addition to or alternating with urticaria. In the other group the dread neurosis was accompanied by morbid blushing and a feeling of inability to speak. The neurotic dread comes first, then the blushing and in one case nausea and retching, and afterward there is headache. In both groups a few applications of hypnosis brought material relief or a complete cure. The intermittent swelling of the knee still persists in the one case.

Münchener medizinische Wochenschrift

August 12, LX, No. 32, pp. 1753-1808

107 Cholesterin Stones. (Wie entstehen die reinen Cholesterinsteine?) L. Aschoff.
108 Serodiagnosis with Animal Placenta and Serum. (Die Abderhaldensche Reaktion mit Tierplazenta und mit Tierserum.) H. Schlimpert and E. Issel.
109 *Dependence of Kidney Functioning on the Nervous System. (Abhängigkeit der Nierenfunktion vom Nervensystem.) P. Jungmann.
110 Orthodiagraphy and Teleroentgenography of the Heart. (Methoden der Herzmessung.) H. Dietlen.
111 The Iodin Method of Sterilization Is Harmless for the Operator. (Bedingt die Methode der Hautdesinfektion mit Jodtinktur eine Gefahr der Jodintoxikation für den operierenden Arzt?) O. Jüngling.
112 *Pathology and Treatment of Diabetes Insipidus. J. Benario.
113 *Impalement and Its Treatment. (Pfählungsverletzungen: Prophylaxe und Therapie der Peritonitis.) F. Weber.
114 Rupture of Uterus after Pituglandol. G. Espeut.
115 *Operative Treatment of Chronic Edema. W. Boecker..
116 Serodiagnosis of Cancer and Pregnancy. (Ueber künstlich herbeigeführte und natürlich vorkommende Bedingungen zur Erzeugung der Abderhaldenschen Reaktion und ihre Deutung.) E. Heilner and T. Petri. (Diagnostischer Wert der Abderhaldenschen Serumreaktion.) F. Bruck. (Zur Technik des Abderhaldenschen Dialysierverfahrens.) M. E. Goudsmit.
117 The Cholestol Reaction. (Zur Kenntnis der Liebermannschen Cholestolreaktion.) W. Autenrieth and A. Funk.

109. **Dependence of Kidney Functioning on the Nervous System.**—Jungmann reports research on rabbits inducing experimental polyuria by puncture of the fourth ventricle. He found that the amount of urine increased sometimes to three times what it had been before the puncture and this polyuria lasted for twelve or twenty-four hours. The proportion of sodium chlorid in the urine also increased regularly, in some instances up to ten times what it had been beforehand. His tests showed further that not the mere incision of the fourth ventricle nor the general anesthesia alone or together induced the above changes in the urine secretion; they did not develop until the puncture had been made through the ventricle into the fascicle of nerve-fiber to the side of the mesial sulcus. The change in the urine secretion occurred irrespective of whether the animals were given much or very little water during the period of the experiments. The animals lost in weight from the elimination of the water. The drying out of the body could be traced by the findings with the refractometer applied to the blood. Immediately after the puncture the blood became diluted, but as the polyuria progressed it became condensed. The blood never showed a larger proportion of sodium chlorid even when the percentage in the urine was markedly increased. The same effect followed each time the puncture was repeated, but the puncture had no effect unless it was made at the special "puncture point" on either side. Severing the splanchnic nerve seemed to have the same effect as the puncture, polyuria and increased output of sodium chlorid following in the same proportions. The puncture produced no effect if the splanchnic nerve had already been divided on both sides. The research confirms the importance of the nervous system in the matter of kidney functioning and that the splanchnic nerve conveys the impulse from the brain to the kidneys.

112. **Diabetes Insipidus.**—Benario reports seven cases which confirm the importance of the Wassermann test as clearing up the etiology of diabetes insipidus; specific treatment as for syphilis soon cured all the morbid manifestations. Polydipsia and polyuria as symptoms accompanying cerebral syphilis have long been known, especially syphilitic lesions in the intermediate part of the hypophysis. This part of the hypophysis seems to have a direct diuretic action. Gummatous tumors in the hypophysis, especially in the posterior lobe, evidently are capable of inducing diabetes insipidus. The development, retrogression under specific treatment and other

changes in these gummatous tumors readily explain the variability of the diabetes picture, and also the inefficacy of treatment if sclerotic changes have already become installed. Gummatous processes in the nasopharyngeal cavity are particularly liable to spread backward to the sella turcica and the hypophysis. With polyuria in the tertiary phase of syphilis, traces of destructive processes in the nasopharynx are common. In every case of diabetes insipidus, therefore, acquired or inherited, syphilis should be suspected even in the absence of any history or signs of it. Examination of the blood and of the cerebrospinal fluid by the Wassermann technic will aid in the differentiation.

113. **Prophylaxis of Peritonitis.**—Weber writes from the clinic in charge of Döderlein to extol the advantages in threatening cases of thorough rinsing out of the abdominal cavity with twenty-five or thirty quarts of physiologic salt solution at 40 C. (104 F.) under general anesthesia. This is done rapidly, the pelvis lowered to the utmost, rinsing out all the recesses and crevices and sopping up with sponges all the superfluous fluid. Then 30 c.c. of tepid 10 per cent. camphorated oil are poured in and distributed with swabs. In 200 cases in which these measures were applied, no injurious consequences could be discovered, while the outcome was satisfactory beyond all anticipations. The method is described here in connection with a case of impalement; a young woman sliding down a hayrick slid on the handle of a buried rake and it entered the vagina and abdomen for twelve or fourteen inches. A long wagon ride was necessary before the girl reached the hospital. The laparotomy next day showed that none of the viscera seemed to be injured. The abdominal cavity was rinsed as above described, the pelvis low, and after washing out quantities of blood the fluid finally came away clear, showing that there was no persisting hemorrhage anywhere. Then the camphorated oil was poured in and spread around, the tear in the peritoneum below the ovary sutured and smooth recovery followed.

115. **Operative Treatment of Chronic Edema.**—The Journal, Jan. 25, 1913, p. 328, described Kondoleon's method of treating chronic edema and elephantiasis by opening a communication between the deep and the superficial lymphatics. Boecker here reports a case of chronic edema in which he operated on the same principle. The patient was a woman of 58 who had had one breast removed on account of cancer, and the arm on this side swelled afterward until the upper arm measured 15 inches in circumference, the forearm over 13 and the hand nearly 13. He made an incision in the back of the arm 8 inches long, under local anesthesia, and cut out a patch of fascia 6 inches long by 1.5 inches wide, suturing the wound at once. By the end of a week the edema began to go down and become softer and although now, two months later, there is still considerable edema, yet it is soft and the woman can use her hand and is able to knit.

Wiener klinische Wochenschrift, Vienna

August 7, XXVI, No. 32, pp. 1297-1324

118 *Vascular Reflexes. (Gefässreflexe.) L. Hess and E. v. Bermann.
119 Vaccine Therapy of Gonorrhea. Brandweiner and O. Hoch.
120 Technic for Intravenous Injection of Neosalvarsan. L. R. v Zumbusch.
121 *Local Diphtheria after Piercing the Ears. (Fall von Diphtherie nach Durchstechen der Ohrläppchen.) R. Pollak.
122 The Ptyalin Content of the Saliva. (Ptyalingehalt des Speichels.) B. Purjesz and O. Perl.
123 Inflammation-Inhibiting Action of Epinephrin. (Zur entzündungshemmenden Wirkung subkutaner Adrenalininjektionen.) F. Gaisböck.

118. **Vascular Reflexes.**—The vascular reflexes were tested in the research reported not only in healthy persons but in several with sclerodermia, advanced arteriosclerosis and syringomyelia. Among the interesting points thus learned is the fact that irritation applied to the skin is liable to entail a vasodilating reflex in conditions which apparently exclude participation of the spinal reflex arc.

121. **Diphtheria Following Piercing the Ears.**—An infant had its ears pierced and [illegible] developed a local diphtheric process in the outer ears and also in the lungs, soon proving fatal. Necropsy disclosed that the throat was entirely free from the diphtheritic process.

Zentralblatt für Chirurgie, Leipsic

August 9, XL, No. 32, pp. 1249-1288

124 *Fascia Flaps in Plastic Operations. (Transplantative Deckung grosser Defekte des Zwerchfells, der Brustwand und des Herzbeutels mit Fascienlappen.) K. Henschen. (Zur Nephropexie mittels freien Fascienstreifens.) E. Cordua. (Verbesserung der Lotheissen-Föderl'schen Radikaloperation der Schenkelhernien durch Anwendung der freien Aponeurosentransplantation.) R. Göbell.

August 16, No. 33, pp. 1289-1328

125 Operative Paralysis of the Triangularis Muscle. P. Manasse.
126 *Operation for Varices with Minute Incisions. (Operation der Varicen mit kleinsten Schnitten.) Holfelder.
127 Pathogenese of Hydrocele. D. G. Zesas.

124. **Fascia Flaps for Patching and Supporting Organs and Walls.**—Henschen writes from the surgical clinic in charge of Sauerbruch to report the successful outcome of extensive experimental research with implants of sheets of fascia to close large defects in the wall of the chest, in the diaphragm and in the pericardium, done under differential atmospheric pressure. He found it possible thus to close a large defect in the diaphragm, working through the pleura, and is confident that the same technic can be applied even with greater ease in the clinic.

Cordua reports the successful use of a broad strip of fascia to suspend the kidney in case of wandering kidney. The method differs from Kocher's technic in that Cordua passes the strip of fascia through the capsule of the kidney, tunneling under the capsule for about half the width of the kidney. This holds the strip in place without the necessity for sutures. The fascia sling thus provided can be fastened to a rib or muscle or aponeurosis as most convenient.

Göbell uses a narrow strip of fascia passed through the transverse and oblique muscles about 2 cm. above their lower margin to reenforce the closure of the canal in operating on a femoral hernia. The muscles are thus dragged down to below the canal and both ends of the fascia strip are then sutured together as they meet after one has been passed besides through the pectineal fascia.

126. **Minute Incisions for Operative Treatment of Varices.**—Holfelder outlines with a stain on the skin the most protruding veins as the patient stands. Then he gives a general anesthetic and expels the blood from the limb and makes incisions not over 1 or 2 cm. along the vein, and exposes and carefully isolates the vein, stripping it entirely free from all clinging tissue. The vein is then severed between two ligatures and the stump is seized with a clamp and carefully wound up on the clamp until the vein tears across. The technic is like that with which Thiersch pulls out a nerve. Holfelder has succeeded in thus pulling out strips of vein totalling on both legs 80 cm. in length. He says that the intima rolls inward as the vein tears, and thus there is no fear of after-hemorrhage and the tiny incisions can be closed at once. He merely ligates the central stump of the saphenous vein in the thigh and pulls out the distal stump alone. In some cases the operation on the leg alone answered the purpose, leaving the thigh intact.

Zentralblatt für Gynäkologie, Leipsic

August 9, XXXVII, No. 32, pp. 1181-1220

128 *Serodiagnosis of Pregnancy, etc. (Klinische Bedeutung des Abderhalden'schen Dialysierverfahrens.) A. Mayer.
129 *Eclampsia. (Zur Schnellentbindung bei der Eklampsie, mit einem Beitrag zur Aderlasstherapie der Eklampsie.) Nacke and Less.
130 *Stretching the Perineum to Start Reflex Contraction of the Uterus. (Ueber artifizielle Scheidendammdehnungen intra partum.) Rudolph.

August 16, No. 33, pp. 1221-1252

131 Importance of Suturing Tears in the Cervix as Prophylaxis of Local Cancer. (Die Trachelorrhaphie als Prophylaxe des Cervixkrebses.) R. Asch.
132 Treatment of Incipient Uterine Cancer. (Zur Therapie des Gebärmutterkrebses in den allerersten Anfängen.) K. Neuwirth.
133 Serodiagnosis of Pregnancy. J. B. Porchownick.
134 Advantages of Incision from Spine to Spine of the Pubis for the Alexander-Adams Operation; Fifteen Cases. (Alexander-Adams mit Tuberkulumschnitt.) G. Zickel.

128. **Clinical Importance of Abderhalden's Method of Serodiagnosis.**—Mayer declares that the contradictory findings reported by some experimenters with Abderhalden's technic are due to the fact that practitioners as a rule are not used to the painstaking exactness of chemically pure methods, and consequently conflicting results are merely because some imperfection has crept into the technic. With increased care and practice, the conflicting findings grow less and less frequent. The clinical importance is obvious of this serodiagnosis of pregnancy at its earliest inception and also after all other signs of it have subsided, as after abortion. In a case described, the suspicion of a recent abortion apparently was not confirmed by the scrapings of the uterus, but the serodiagnosis was positive. Renewed examination of the scrapings finally revealed decidua tissue. The reaction is positive with an extra-uterine as with a normal pregnancy, but it becomes negative in both after the tissues specially connected with the pregnancy have lost their vitality from the death of the fetus. Mayer reports further research with the test as applied in eclampsia and various complications of pregnancy. The response shows that the protective ferments involved keep constant, like the behavior of the blood. The response to the test also throws light on the functioning of the glands with an internal secretion, as also on metabolic disturbances and on cancer, as he illustrates with cases from his own experience. He suggests further that it may prove interesting to study racial differences in the reaction to the biologic tests.

129. **Venesection in Eclampsia.**—Less states that twenty-four of twenty-six women recovered under the ordinary measures; two were spontaneously delivered, the rest required active intervention. Among the patients were some with from twelve to forty seizures. Two of the patients succumbed. In another group of twenty-two cases venesection was applied, withdrawing from 250 to 1,200 c.c. of blood followed by saline infusion. Two in this group died also. One patient had no further seizures after the venesection; delivery occurred eight hours later. Three with eclampsia after delivery had only one seizure each after the venesection. The benefit seemed striking in another case of puerperal eclampsia. None of the women died whose eclampsia did not develop until after delivery.

130. **Artificial Stretching of the Perineum During Delivery.**—Rudolph calls attention to the reflex contractions of the uterus which occur when the perineum is stretched. The head of the fetus striking the perineum sets up vigorous contractions of the uterus by this reflex action; it is started also by introduction of the curet into the uterus. To induce the contraction when the fetal head is unable to reach down to the perineum or when the labor pains are growing weak from any cause, he introduces into the vagina his forefinger and middle finger pressed together and then spreads them apart sideways and presses them backward, stretching the perineal portion of the vulva and massaging it lightly at the same time. The uterus responds at once with contractions and the procedure has enabled him to get along without forceps in a number of cases in which their use otherwise would have been indispensable. The stretching and mobilizing of the perineum in this way materially facilitates the passage of the fetal head when it comes along, as the perineal tissues are rendered more elastic and the parturient is thus saved considerable physical stress and pain. He has not always been able to avoid the necessity for side laceration or incision, but he always knew the cases in which this was impending as the tissues refused to yield to his stretching.

Gazzetta degli Ospedali e delle Cliniche, Milan

August 14, XXXIV, No. 97, pp. 1007-1014

135 *The Test for Neutral Sulphur in the Urine. (Sulla prova dello zolfo neutro urinario.) L. Dozzi.

135. **Sulphur Reaction in the Urine as Sign of Cancer.**—Dozzi reviews his experience with fifty patients to whom he applied the test mentioned in THE JOURNAL, Aug. 10, 1912, p. 492, and elsewhere. The test was invariably negative in all his patients free from cancer or tuberculosis; but the frequency of the positive reaction in tuberculous patients detracts from its value as a sign for cancer, although it is rarely that cancer and tuberculous could be confused. In three of his cancer patients the neoplasm had been removed before the test was applied, and these were the only cancer cases that gave a negative response.

Policlinico, Rome

August, XX, Medical Section No. 8, pp. 337-384

136 *Reinfection with Syphilis or Superinfection. (Contributo clinico e osservazioni critiche sulle reinfezioni, superinfezioni e recidive sifilitiche a tipo primario.) G. Mariani.
137 Research on Rabies. (Sulla importanza per la eziologia della rabbia, di talune formazioni libere descritte di recente.) I. Righi.
138 The Nitrogen Compounds in the Urine in Febrile Diseases. (Il comportamento dei composti azotati nelle urine in alcune malattie febbrili.) U. Daretti. Commenced in No. 7.
139 The Changes which Accompany the Putrefaction of the Blood-Serum. (Di alcune modificazioni che accompagnano la putrefazione del siero di sangue.) G. B. Zanda.

August, Surgical Section No. 8, pp. 337-384

140 Treatment of Fistulas and Bone Cavities in the Mouth. (Otturazione di cavita patologiche delle ossa in odontoiatria.) A. Chiavaro.
141 Experimental Research and Behavior of Epiphyseal Cartilage in Operations on Joints. (Comportamento delle cartilagini epifisarie negli interventi operativi articolari.) G. Razzaboni.
142 Primary Endotheliomas in the Bones; Two Cases. (Endotelioma primitivo delle ossa.) M. Abetti.
143 Treatment of Undescended Testicle. (Alcune osservazioni sopra il trattamento chirurgico dell'ectopia testicolare.) G. Piccioli.
144 Relations between the Hypophysis and the Ovaries or Testicles. (Sui rapporti tra ghiandole sessuali ed ipofisi.) V. Barnabo.

136. **New Infection or Superinfection with Syphilis?**—Mariani tabulates the details of four cases from his own practice at Pavia and of twenty-six from the literature in which an apparently primary syphilitic lesion developed from a few months to several years after the actual primary infection. Some date from before the discovery of salvarsan; in some cases there had been mercurial or salvarsan treatment or both, in others no treatment had been applied. In MacDonald's case there had been scant mercurial treatment after which six years passed without any manifestations or therapeutic measures. Then an apparently primary syphilitic lesion developed near the scar from the first, on the corona. In Mariani's own cases salvarsan had been given to each patient and the interval was from four months to two years. He discusses the various theories advanced to explain such eventualities, classifying the cases according as a new cycle of the specific infection developed or as either of the cycles was incomplete.

Riforma Medica, Naples

August 9, XXIX, No. 32, pp. 869-896

145 Persisting Cholesterinuria. (Caso raro di colesterinuria vera duratura.) M. Barberio.
146 Motor Aphasia and Deafness Following Epileptic Seizures. (Afasia motrice e sordita postaccessuale.) A. Perugia.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

July 19, LVIII, No. 3, pp. 153-212

147 *The Special Prison at Scheveningen. (De bijzondere Strafgevangenis te Scheveningen.) J. W. Deknatel.
148 *Polygonum Avicular L. as a Laity Remedy for Diabetes Mellitus. (Polygonum Avic. L. als volksmiddel tegen diabetes mellitus.) E. C. van Leersum.

July 26, No. 4, pp. 213-284

149 *The Value of the Dry Test-Meal in Estimating the Motor and Secretory Function of the Stomach. (De waarde van het drooge proefontbijt van Triscuit ter bepaling van de motorische en secretorische functie der maag.) N. P. van Spanje.

August 2, No. 5, pp. 285-368

150 Para-Articular Correction of Joint Deformities. (Over para-articulaire correctie van gewrichtsmisvormingen.) M. A. Correa.
151 Epidemic Poliomyelitis; Five Cases. (Eenige gevallen van de ziekte van Heine-Medin.) W. Beijermann.
152 The Movement for Training Both Hands. (De "Ambidextriebeweging.") D. Herderschee.

147. **The Prison at Scheveningen.**—This new institution is for sifting out the criminal insane and criminals, and its first year's report is here presented. The article also contains a very interesting section on the legislation of other

countries in regard to the criminal insane, emphasizing particularly wherein the English "Mental Deficiency Bill" differs from other criminal laws.

148. **Doorweed or Birdweed as a Lay Remedy for Diabetes Mellitus.**—Van Leersum states that after making many tests he did not derive any benefit from the use of this herb.

149. **The Dry Test-Meal.**—Van Spanje calls attention to the advantages of a dry test-meal, saying that triscuit seems to be particularly adapted for a test-meal without fluids. It is put up in packages of twenty-four biscuits each and is made of the whole wheat flour. The gastric juice has no or very little influence on it. This test-meal has several advantages over others, as the exact amount of gastric juice can be estimated, because no liquids are given with it.

Medizinskoe Obozrienie, Moscow

LXXIX, No. 8, pp. 647-734

153 Atypical Forms of Pseudoleukemia. (Hodgkin's Disease.) G. A. Shamessoff.
154 Gangrenous Sore Throat in a Child. B. A. Egiz.
155 Present Status of Roentgenotherapy in Gynecology. M. I. Karlin.
156 Pseudoleukemia. (Granuloma malignum. Lymphogranulomatosis.) G. G. Vulfius.

Petersburger medizinische Zeitschrift

August 14, XXXVIII, No. 15, pp. 175-187

157 *Diagnostic Importance of Daily Paroxysms of Pain in Women. (Periodische Schmerzen bei Frauen.) H. Greife.

157. **Daily Paroxysms of Pain as Sign of Uterine Cancer.**—Greife reports a case which sustains the diagnostic importance of "Simpson's pains" as stated recently in The Journal, Sept. 14, 1912, p. 908. His patient was an unmarried woman of 50, healthy until April, 1912, when she began to have paroxysms of pain every afternoon and later also in the evening. The pains were very severe, starting in the lower abdomen and radiating down into the legs, not relieved by heat or cold, the paroxysm lasting about four hours on an average at first and later from five to six hours, with no let-up except under morphin. Nothing could be found to explain the pains until palpation through the rectum revealed a tumor in the uterus, supposed to be a myoma. On account of the intact hymen, supravaginal amputation of the uterus was done by a laparotomy. On opening the excised uterus two days later it was found filled with a cancerous growth. The abdomen was opened again in two or three weeks and the rest of the uterus then cut out. The patient was relieved from the first of all pain and has been in good health since.

Semana Medica, Buenos Aires

July 10, XX, No. 28, pp. 61-116

158 Necessity for Mastering Technic for Suture of Vessels in Readiness for Emergencies. (Cirugia vascular.) B. N. Calcagno.
159 Vaccine Therapy of Gonorrhea. (El nucleidoproteido gonococcico en el tratamiento de las complicaciones blenorragicas.) R. A. Marotta.
160 Glaucoma. (Tonometria. Operacion de Elliot. Pronostico del glaucoma.) J. M. Zubizarreta.
161 Epithelioma in Sheep. (Una enfermedad nueva del ganado ovino.) M. Beatti.
162 *Test for Seminal Fluid. (Todavia otro nuevo reactivo del esperma.) A. Lecha-Marzo and A. Conejero.
163 Technic for Thoracocentesis. D. A. Rojas.
164 *The Urochromogen Reaction in the Urine of the Tuberculous. (La reaccion de Moritz-Weiss—prueba del permangano—en la orina de los tuberculosos.) G. Vitri.

162. **Medicolegal Examination of Seminal Stains.**—This article states that the rectangular and pointed crystals obtained with the Florence reagent are not so characteristic of seminal fluid as the ovoid crystals which occur singly or in groups. These ovoid crystals were discovered simultaneously last year by De Dominicis and Baecchi not only with the Florence reagent but with Dragendorf's. By modifying the Florence reagent a little these ovoid crystals show up much better, and Lecha-Marzo and Conejero are convinced that the round and ovoid crystals are the only ones for which the seminal fluid is directly responsible, the rectangular and pointed crystals being crystals of the decomposition products of lecithin, as Richter has pointed out. Their reagent is like the Florence only that it contains more iodin: Potassium iodid 1 gm.; iodin 0.5 gm.; distilled water, 25 gm. The Mangini reagent used in testing alkaloids also shows up the crystals unusually well. A microscope of only 500 diameter power is ample for the purpose.

164. **Urochromogen in the Urine.**—Vitri regards Weiss' permanganate test for urochromogen in the urine as an important aid in the diagnosis and especially in the prognosis of tuberculosis. He has applied the test to 150 tuberculous patients; the reaction is slight or absent in extrapulmonary tuberculous lesions but in acute pulmonary tuberculosis it is almost invariably positive, while it is negative during the first stage of tuberculosis running a chronic course. Of thirty-two tuberculous patients who gave a decided positive reaction, fourteen have died since, while only three have died of the fifty-six giving a negative response to repeated applications of the test, and of these three two died from an intercurrent disease. Weiss says that the urochromogen is the substance which gives the diazo reaction or its precursor, but according to Vitri's experience the urochromogen test is more sensitive than the diazo. The findings paralleled each other with the two tests in forty-eight cases, but in six others the urochromogen test was positive while the other was negative. He never obtained a positive diazo with a negative urochromogen reaction.

The findings were also remarkably concordant with the urochromogen test and the skin tuberculin test. In twenty-three cases the skin tuberculin test elicited a very slight or no response, the body evidently being incapable of a pronounced reaction, and in these cases the urochromogen reaction was always very pronounced and thirteen in this group have died since. In forty-three other cases the skin tuberculin reaction was very pronounced, while the urochromogen reaction was slight or negative, and the prognosis was comparatively favorable in all these cases. In nine cases both reactions were pronounced but the favorable outlook suggested by the pronounced response to the skin tuberculin test was not realized; in fact, eight of the patients died not long after as the pronounced response to the urochromogen test had foretold. In only four of the total cases were the urochromogen findings misleading. The urochromogen test is applied by filling a test-tube to one-third with the urine to be examined. It is then diluted with twice its volume of water, and well mixed. Half of the fluid is then poured into a second tube of the same size, and to one of the tubes are added three drops of a 1 per cent. solution of potassium permanganate in distilled water. The tube is then shaken to mix the contents. A yellow tint appears in case of a positive response as the two tubes are compared. A little sugar, albumin or urobilin in the urine does not interfere with the reaction.

Hospitalstidende, Copenhagen

August 6, LVI, No. 32, pp. 933-956

165 *The Wassermann Test Applied to the Cadaver. (Betydningen af Wassermanns Reaktion, anstillet paa Ligblod.) H. Boas *and H. Eiken.*

165. **The Wassermann Test Applied to the Cadaver.**—Boas and Eiken state that the usual technic applied to the cadaver gives unreliable findings as numbers of positive responses are obtained when there is nothing to suggest syphilis otherwise. By reducing the dose to half the ordinary amount, namely 0.1 c.c. instead of 0.2 c.c., the reaction becomes much more reliable. Only three out of 326 controls gave a positive reaction with this technic. Negative findings in the cadaver are less significant than negative findings in the clinic. They obtained a negative reaction in five of twenty-nine cases of untreated active syphilis.

Ugeskrift for Læger, Copenhagen

August 14, LXXV, No. 33, pp. 1359-1404

166 Formaldehyd Sterilization of Woolen Carpets and Rugs. (Undersøgelser over Uldtæppedesinfektion med Formaldehyd.) A. Elgstrøm and A. Erlandsen. Commenced in No. 32.
167 Twenty Years of Night Medical Service at Police Station. (Natpraksis—1891-1912.). K. Nørregaard.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXI, No. 13.—PART 1 CHICAGO, ILLINOIS SEPTEMBER 27, 1913

OZONE: ITS BACTERICIDAL, PHYSIOLOGIC AND DEODORIZING ACTION [*]

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THE BACTERICIDAL ACTION OF OZONE

The use of ozone as a gaseous disinfectant has often been advocated, but the claims made for its efficiency have little or no experimental basis. [Review of earlier investigation omitted.]

Our own experiments have been carried out (1) to determine the germicidal action of ozone on pure cultures under the conditions commonly used in testing disinfectants, and (2) to determine the effect of ozone on the ordinary air bacteria.

All experiments were carried out in a small room of about 26 cubic meters. There was one door and one window in the room. In the first experiment there was ventilation to the room through a 3-inch hole in the window. In the remaining experiments there was no ventilation, the air being worked over and over.

The ozone generator described later was placed at one side of the room about 4 feet from the floor, and was run at high speed throughout the experiments.

Analysis of the products coming direct from the ozonator showed no oxids of nitrogen present in 10 liters (quarts) of the air.

An analysis was made of the products coming direct from the machine while running at the two different speeds. Speed 1 showed a concentration of 3.5 parts of ozone per million; speed 2 showed a concentration of 8.9 parts of ozone per million.

Staphylococcus pyogenes aureus and *Bacillus pyocyaneus* were the organisms used in each experiment, being taken in each case from a twenty-four-hour broth-culture. Equal parts of litmus milk and peptone broth were used in determining the growth of the organisms after exposure.

EXPERIMENTS

EXPERIMENT 1.—Sterile cotton threads 1 inch in length were immersed in twenty-four-hour broth-cultures and then placed in envelopes. One-half the number of threads were allowed to dry for two hours at ordinary room temperature before exposure, while the other half were exposed in a moist condition. Small pieces of each thread were retained and used as controls. No inhibitory effects were visible. [Table 1 omitted.]

EXPERIMENT 2.—The organisms were exposed for periods of one and one-half hours, three hours and four and one-half hours, respectively. Only moist bacteria were used. They were exposed in Petri dishes on strips of filter-paper immersed in the twenty-four-hour broth-culture. No inhibitory effects could be seen in any of the exposures. [Table 2 omitted.]

EXPERIMENT 3.—The organisms were exposed in both dry and moist condition, on threads in envelopes and on filter-paper in Petri dishes. The first twenty-four of these experiments or tests were carried out on filter-paper. Part of the organisms exposed were dried in an incubator at 37.5 C. (99.5 F.). The last twenty-four of these experiments were carried on similarly to the first half, but with threads in envelopes. [Table 3 omitted.]

All tests in this experiment showed no effects of the ozone. No difference could be detected between the growth of those organisms at the highest concentration of ozone after long exposure, and those exposed for the short period and at the lower concentration.

EXPERIMENT 4.—Small pieces of sterile filter-paper were immersed in the broth-cultures and half of them allowed to dry for two hours in an incubator at 36.7 C. (98.06 F.). At the end of two hours small pieces were retained as controls, while both moist and dry strips of paper were exposed to the ozonator products in small cheese-cloth sacs for varying periods of time and in different positions.

The only difference in this experiment from those preceding is that *B. pyocyaneus*, dry, showed no growth after twenty-four hours of incubation at 37 C. (98.6 F.). At forty-eight hours, however, there existed no difference between this culture and the others. [Table 4 omitted.]

EXPERIMENT 5.—The organisms were exposed in the cheese-cloth sacs as in Experiment 4. The results were practically the same as in the preceding experiment.

Those organisms exposed for the longest time were placed in the position in which the concentration of the ozone was 8.9 parts per million, and here no inhibitory effects could be detected. [Table 5 omitted.]

EXPERIMENT 6.—Only moist bacteria were exposed on filter-paper for a period of three hours.[*] An analysis was made after two hours of the ozone coming ino the room, and 4.06 parts per million were found, while at three hours there were 4.5 parts present. [Table 6 omitted.]

EXPERIMENT 7.—Agar and gelatin plates were exposed to the ozone; some of the plates were streaked with *B. coli* and *B. pyocyaneus* both before and after exposure. The experiment was carried out under the same conditions as the preceding experiments and the exposure was for five hours. The machine was run at the highest speed and the concentration of ozone determined after two hours and after five hours. After two hours' running the concentration was found to be 3.6 parts per million and after five hours, 4.8 parts per million. All the plates exposed were directly in front of the exhaust and as close as possible to the machine. The following showed good growth:

Agar exposed and streaked with *B. coli* afterward.
Agar unexposed and streaked with *B. coli.*

Agar exposed and streaked with *B. pyocyaneus* afterward
Agar unexposed and streaked with *B. pyocyaneus.*
Agar streaked with *B. pyocyaneus* and then exposed.

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[*] This investigation was carried on at the suggestion of, and under a grant from, THE JOURNAL of the American Medical Association.

[*] Tabular matter, certain details of investigation, etc., are here omitted. The article will appear in full in a pamphlet, a copy of which may be had by sending stamped, directed envelope to this office.

Gelatin exposed, then streaked with *B. pyocyaneus.*
Gelatin unexposed and streaked with *B. pyocyaneus.*
Gelatin streaked with *B. pyocyaneus* and then exposed.

One day later good growths developed in the following tubes:

Gelatin exposed, then streaked with *B. coli.*
Gelatin unexposed and streaked with *B. coli.*
Gelatin streaked with *B. coli* and then exposed.

EFFECTS OF OZONE ON AIR BACTERIA

In the following experiments the conditions were the same as in the preceding experiments. The dust in the experimenting-room was stirred up by the use of a rag; the room was then closed for fifteen minutes to allow the dust to become evenly mixed with the air. At the end of this period four sterile agar plates were exposed for a period of twenty-five minutes, at the end of which the plates were collected from the various points in the room where they were exposed and incubated for twenty-four hours at 37 C. (98.6 F.). At the end of the twenty-five-minute period the electric fan in the ozonator was allowed to run for one hour, after which four more agar plates were exposed in various places for the original period of twenty-five minutes. At the expiration of this period the plates were collected and incubated for twenty-four hours at 37 C. This experiment was carried out in the morning. The room was left alone until the same afternoon, at which time the dust was stirred up as in the morning and then left for fifteen minutes. Then the same experiment was carried out as in the morning with the exception of the running of the electric fan, in place of which the ozonator was allowed to run at Speed 2 as in the previous experiments. Twenty-four hours later the colonies on the plates were counted. The results were as follows:

Experiment 8.—Four plates were exposed for twenty-five minutes.

Exposure	Colonies
Before running of fan	38
After running of fan	56
Before running ozonator	64
After running ozonator	38

Experiment 9.—Four plates were exposed for twenty-five minutes.

Exposure	Colonies
Before running of fan	28
After running of fan	23
Before running ozonator	49
After running ozonator	18

Experiment 10.—This experiment was carried out in the same room and with the same machine as the preceding experiments. Five agar plates were exposed to the air at various points in the room for a period of thirty minutes before and after the running of the electric fan and the ozonator. The number of colonies before running the fan was fifty-eight; after running the fan, seventy-three.

Plates were now exposed at the same points and then the ozonator, instead of the electric fan, was allowed to run for an hour. The number of colonies before running the ozonator was sixty-one; after running the ozonator. sixty-seven.

Experiment 11.—This experiment was carried out as Experiment 10 with the exception that the dust was stirred up in the room thirty minutes before exposure of the plates before running the ozonator and the fan. The number of colonies before running the fan was seventy-one; after running the fan, fifty-seven. The number of colonies before running the ozonator was seventy-eight; after running the ozonator, thirty-four.

The results of these experiments show that:

1. No surely germicidal action on certain species of bacteria could be demonstrated by the usual disinfection tests with amounts of gaseous ozone ranging from 3 to 4.6 parts per million.

2. The alleged effect of ozone on the ordinary air bacteria, if it occurs at all, is slight and irregular even when amounts of ozone far beyond the limit of human physiologic tolerance are employed.[6]

[Review of early investigations omitted.]

The most recent contribution to the physiology of ozone is that of Hill and Flack.[7] These investigators failed to obtain any evidence that ozone in small concentrations stimulates the respiratory metabolism, but they confirm Bohr and Maar in finding that any considerable concentration (even less than 1 per million) of ozone diminishes the oxygen intake and the carbon dioxid output. This was established for mice, rats and man. Exposure of ten minutes to ozone in concentrations of 1 part to five millions may lower the rectal temperature of rats as much as 3 degrees.

Hill and Flack also observed the depression and coma following the initial restlessness on breathing strong concentrations of ozone (from 2 to 20 parts per million of air).

THE OZONE GENERATOR

The ozone in our experiments was produced by the "Ozonator" manufactured by the General Electric Company, the type for the direct current. The company states that this machine gives a flow of ozonized air of about 4,250 cubic feet per hour. The machine is made to deliver ozonized air in two different concentrations, designated as 1 and 2. The change from 1 to 2 is made by simply turning a key.

The method of Baumert as modified by Hill and Flack was used for determining the ozone concentration. Ten liters of ozonized air were drawn through a bottle containing 50 c.c. of 1 per cent. solution of potassium iodid acidified by 5 c.c. of 10 per cent. solution of sulphuric acid, 1 c.c. of 1 per cent. solution of boiled starch added, and titrated with the hyposulphite solution. The hyposulphite solution was made up to contain 0.222 gm. per liter, so that 1 c.c. of the solution represented 1 part of ozone per million parts of air when 10-liter air samples were used.

Tests of the air coming directly from the machine yielded the following results: Concentration 1, from 4 to 5 parts of ozone per million parts of air. Concentration 2, from 10 to 11 parts of ozone per million parts of air. After five weeks' more or less constant use each day the machine yielded a somewhat lower ozone concentration.

Tests for the oxids of nitrogen in the ozonized air were made after the machine had been in use five weeks, with negative results.

THE INFLUENCE OF STRONG CONCENTRATIONS OF OZONE ON MAMMALS

These results simply confirm the findings of previous observers. Ozone in any considerable concentration is an intense irritant to the respiratory tract and other mucous membranes, and causes illness and death from edema of the lungs.

THE RATE OF DECOMPOSITION OF OZONE BY THE MUCOUS MEMBRANES OF THE NOSE AND THE PHARYNX

In three dogs and two rabbits tracheotomy was performed under ether, a tracheal cannula inserted well below the larynx, the wound treated with cocain, and the animals allowed to recover from the ether anesthesia. In these animals the ozonized air entered the trachea directly, and no air entered the nose and larynx. When these animals were exposed to ozone in concentrations of 10 parts to one million parts of air, the irritation and edema of the trachea and the lungs developed much sooner than in the animals breathing through the nose—on the whole about four times faster. It thus takes only about thirty minutes' exposure to develop the degree of hyperemia and edema of the bronchi and the lungs produced by a two hours' exposure in the animal breathing through the nose. Evidently at least three-fourths of the ozone in the inspired air is decomposed by the mucous membrane of the upper end of the respiratory passages. The strength of ozone in the inspired air is therefore no measure of the concentration of ozone that comes in contact with the alveolar epithelium. This rapid destruction of the ozone by the mucous membrane of the upper end of the respiratory passages acts, of course, as a protecting mechanism for the lung tissue.

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[6] After the work recorded in this paper was practically completed an article by Konrich appeared, Zur Verwendung der Ozone in der Lüftung, Ztschr. f. Hyg., 1913, lxxiii, 443. The results of this observer are essentially similar to our own.

[7] Hill and Flack: Proc. Roy. Soc., 1911, lxxxii, 404; Jour. Roy. Soc. Arts, 1912, lx, 344.

Our results on this point find corroboration, indirectly, in the observations of Hill and Flack that there is no demonstrable amount of ozone in the expired air when one is breathing an air-ozone mixture.

THE INFLUENCE OF OZONE IN THE INSPIRED AIR ON THE HEART AND THE BLOOD-PRESSURE IN THE DOG

As already pointed out, a stage of depression and drowsiness or coma due to breathing ozone in strong concentrations has been noted by many observers. Binz went so far as to assert that ozone was a sleep-producing gas. The depression or coma was very evident in our animals. And during this work with the animals one of us (A. J. C.) unavoidably breathed ozone in varying concentrations for short periods. If the ozone concentration was fairly strong, or if the weaker ozone concentrations were respired for longer periods, drowsiness and headache invariably followed.

It is quite evident that the ozone in the respired air does not reach the blood-stream. What, then, is the cause of the headache and the depression or drowsiness? These symptoms may be due to:

1. Depression of the tissue metabolism in consequence of the depression of the gaseous exchange in the lungs, as shown by the investigations of Bohr and Maar and of Hill and Flack.
2. Reflex effects on the central nervous system from the irritation of afferent nerve endings in the respiratory passages.
3. Cardiac and vasomotor changes due to *(a)* the stimulation of nerve endings in the respiratory tract, or *(b)* the altered metabolism of the tissues.

So far as we are aware the cardiac and vasomotor changes on exposure to ozone have not been extensively studied. Our method of procedure was as follows:

[Description of method omitted.]

When the animal breathes in the normal way through the nose, the ozonized air always causes a primary acceleration of the heart and an increase in the amplitude of the pulse. There is usually not very marked change in the carotid blood-pressure during this first phase. The changes in the heart activity have been observed *pari passu* with a lowered as well as with an increased blood-pressure. If the exposure to the ozone is continued for from thirty to sixty minutes, the strength of the heart-beat gradually fails and there is a corresponding gradual fall of the carotid blood-pressure. A typical tracking showing these changes at the beginning of an ozone period is given in Figure 1. The final weakening of the heart and lowering of the blood-pressure is illustrated in Figure 2.*

In one case we were fortunate in securing record of the heart-beat and the blood-pressure during what seems to be a period of Cheyne-Stokes respiration. This came on ten minutes after the cessation of a thirty-minute breathing (tracheal tube) of ozone in the concentration of 10 parts to one million parts of air. The somewhat labored and irregular respiration stopped abruptly, and we thought that the animal was about to die from respiratory failure, but we decided not to resort to artificial respiration so long as the heart was in fair condition. After a respiratory standstill for four and one-half minutes, five fairly strong respiratory movements were made spontaneously, and then followed a second standstill for two minutes, and again two respiratory movements followed by a third period of standstill lasting for one minute. After this third period the respiratory movements persisted with fair regularity. The blood-pressure record is reproduced in Figure 3.*

The slowing and weakening of the heart at the beginning of the first and longest period of respiratory standstill is in all probability due to vagi action (stimulation of the medullary centers by the increased carbon dioxid in the blood). The apparent recovery of the heart strength before the reappearance of the respiration is probably due to the initial stimulating action of increased carbon dioxid on the heart tissues directly, as shown by Henderson and by Starling. This condition of the heart persists despite the two brief periods of respiratory movements, because these were not sufficient to remove the excess of carbon dioxid, especially as activity of the lung tissue was greatly depressed by the ozone. The rapid and temporary rise of the carotid blood-pressure simultaneously with the respiratory period must be due to some association between the respiratory and the vasoconstrictor centers in the medulla.

When these striking changes in the heart and the respiration appeared, the dog was already in a state of marked depression or coma. There can be no question that the feeble heart-beat and low blood-pressure noted after prolonged exposure to strong ozone concentrations are factors in the depression or coma following the ozone breathing; but these changes are also accompanied by irritation, depression and edema of the respiratory tract. The drowsiness and headache produced by ozone in man certainly appear long before there is any marked edema of the respiratory tract, weakening of the heart, or persistent lowering of the blood-pressure. The cardiac and vasomotor changes that are seen in dogs at the beginning of the ozone exposure do not seem sufficient to cause drowsiness or headache. In order to settle this point more definitely the following experiments were made on man.

THE INFLUENCE OF BREATHING OZONE ON THE HEART AND THE VASOMOTOR MECHANISM IN MAN

Three men (A. J. C., F. H. M., W. A. S.) served as subjects in these tests. The blood-pressures were recorded by the Erlanger sphygmomanometer, the cuff being adjusted to the left arm. The subject sat a few inches away from and facing the ozonator, so that the respired air contained the full concentration of ozone as it came from the machine (5 parts and 10 parts per million, respectively). The results were uniform and practically without exception. The respiration of ozone caused an increase in the amplitude of the heart-beat, without any appreciable or constant change in the rate of the beats or in the blood-pressure. It is to be noted, however, that the exposure to the ozone was of brief duration, that is, only long enough to complete a test. Typical records obtained by the sphygmomanometer under these conditions are reproduced in Figure 4.

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* Figures omitted here are included in reprints.

The exposure to ozone during these tests was sufficient to cause drowsiness and headache. One of the subjects actually fell asleep during one test. This happened to be a test with the plethysmograph, but there was no vasodilatation of the arm similar to that of normal sleep. Possibly the sleep was too brief and too light for this reaction to appear. It does not seem to us that the cardiac and vasomotor changes revealed by these tests are sufficiently great to account for the drowsiness and the headache.

The ozone headache may come on during or shortly after a brief exposure to ozone in greater dilutions; in some cases it comes on two or three hours after the exposure. If the ozone exposure has been rather marked the headache may persist for from two to six hours. According to our experience, it is always a frontal headache, similar to that in the case of "head-cold." We believe that this headache is due to irritation and consequent hyperemia of the frontal sinuses by the ozone. This view is supported by the fact that such hyperemia of the sinuses is actually present in dogs after exposure to ozone.

In this connection we may note that the breathing of ozone in concentrations up to 10 parts per million for short periods not exceeding a total of fifteen minutes produces "sore throat" that persists for two or three days. The "sore throat" is occasionally accompanied by some pain in the chest. These conditions are evidently due to the corrosion of the mucous membrane by the ozone.

One of the subjects (W. A. S.) had "sore throat" ("cold") at the beginning of these experiments. We had here an opportunity to see whether or not the inhalation of ozone in the greatest concentration that may be used with safety for a short period will check the bacterial invasion of the throat either by directly killing the bacteria or by producing hyperemia through the irritation, as suggested by Hill and Flack. The daily exposure to the ozone not only did not improve, but actually aggravated the sore throat. It is not improbable that the impairment of the cells of the mucous membrane by the corrosive action of ozone renders the cells less resistant to bacterial invasion.

CAUSE OF THE DROWSINESS, DEPRESSION AND COMA FOLLOWING EXPOSURE TO OZONE

We have seen that the cardiac and vasomotor changes are probably not important factors. There remains then to consider the part played by direct depression of the nervous system from stimulation of the nerve endings in the respiratory tract, by the absorption of toxic substances from the cells of the respiratory tract injured by the ozone, or by the lowered metabolism of the tissues following the diminution of the gaseous exchange in the lungs.

It would seem that, if the afferent impulses play an important part in the depression and coma, these effects ought to be influenced by tracheotomy and section of both vagi. When the animal breathes through a tube inserted well below the larynx, the irritation of the upper end of the respiratory tract by the ozone is eliminated. Section of both vagi cuts off (at least in the main) the nervous impulses from the lungs and the bronchi.

A number of tests were made on dogs and rabbits thus prepared. The changes in the respiratory movements following double vagotomy, especially in dogs, are disturbing factors. Our results showed that animals with both vagi cut succumb more quickly from ozone than the animals with the vagi intact, but the depression and coma are not apparent until a degree of lung injury is reached from which the animals do not recover. When the vagi are intact the animals may recover completely from exposures to ozone sufficient to cause marked depression.

It would therefore seem that the afferent nervous impulses due to the irritation of the respiratory tract by the ozone contributes to the ozone depression and coma, but that the changes in the metabolism, and possibly in the composition of the blood, are by themselves capable of causing depression, especially after prolonged ozone exposure.

THE INFLUENCE OF WEAK CONCENTRATIONS OF OZONE BREATHED FOR LONG PERIODS

The physiologic tests with ozone so far dealt with involve an ozone concentration that might be employed in experimental therapeutics, but which is out of the question for the purposes of ventilation. For ventilation purposes the ozone must not reach a concentration that leads to irritation and obvious injury, or too intense odor. This concentration is considerably below 1 part of ozone per million parts of air. Most people can probably tolerate a strength of the ozone odor represented by an ozone concentration ranging from 1 in twenty millions to 1 in five millions, although to some persons even the faintest odor of ozone is disagreeable. What is the physiologic action of ozone at such low concentration? On this point we have the assertions of parties financially interested, and the assertions of enthusiasts not hampered by a critical judgment, but practically no facts. Thus we are told that a few months' use of ozone in the ventilation system increased the chest expansion of office workers by several inches; that the favorable influence of mountain climates is due to the trace of ozone in the mountain air, etc.

Bohr and Maar and Hill and Flack have shown that ozone depresses the gaseous exchange in the lungs before there is any demonstrable injury to the lung tissues, or in concentration too weak to produce inflammation and edema. This would constitute a decidedly injurious influence of ozone. But it is obvious that the ozone concentrations employed by these observers were greater than that permissible in practical ventilation.

Concentrations of ozone of 1 part per million parts of air are certainly injurious, but it does not follow that the weaker concentrations of ozone are proportionally injurious. It is furthermore certain that the animal organism is capable of compensating for or repairing very slight injurious actions of ozone as well as of other toxic substances. It will therefore be very difficult to obtain reliable evidence as to any favorable or unfavorable physiologic action of such ozone concentrations as are practicable in ordinary ventilation. Nevertheless the following test was carried out:

Four cats, four rabbits, six guinea-pigs, and twelve rats were placed in comfortable cages in a room of twenty-six cubic meters' capacity. The ventilation arrangements of this room were such that the air of the room could be renewed at a rate varying from thirty minutes to about twelve hours. The room was provided with double doors and double windows. The inside door was provided with a large glass panel, so that it was possible to observe the animals without entering the room. The ozonator was placed in the room in such a position that none of the animals were in the direct line of the ozonized air current. The samples of air from the room for the ozone estimations were secured by glass-tubing connections through the wall. The glass tubing was placed so that air samples could be taken near the floor near the ceiling, and midway between the floor and the ceiling.

When the number of animals mentioned were in the room, and the rate of exchange of the air in the room was adjusted to about two hours, running the ozonator at the highest concentration capacity for five minutes brought the ozone concentration in the room up to about 1 part per million parts of air. In from twenty-five to thirty minutes after stopping the ozone generator, the ozone in the room had been removed or decomposed to such an extent that it was no longer irritating to the eyes and nose; but it could still be detected by its odor. At this point the ozonator was again turned on for five minutes. This process was kept up for about nine hours each day (from 8 a. m. to 5 p. m.) for a period of two weeks.

The points taken into consideration were, body-weight, appetite and general condition. The animals were kept in the cages in this room from February 24 to March 10, that is for two weeks before the ozone test was started, in order to secure controls. We aimed to select only healthy and vigorous animals, but one of the rats proved to have advanced tuberculosis of the right lung. This rat developed marked irregularities of the respiration at the end of the first week of the ozone exposure, and died on the tenth day. Post-mortem examination showed pneumonia ("red hepatization") of the lung not affected by tuberculosis. It is not improbable that this pneumonia was caused by the ozone, but no conclusion can be based on a single case.

One of the rabbits proved to be pregnant, and gave birth to two young ones, March 21, that is, on the eleventh day of the ozone exposure. One of the young was still-born and weighed only 60 gm., and the mother neglected the other one. We are of the opinion that the birth was a premature one by at least a week. It was noted that the new-born rabbit was more strongly affected (irregularity of respiration) by the ozone than the adult rabbits.

Each animal was weighed once a week. The general summary is presented in Table 7 [omitted]. All the animal groups showed some increased body-weight, but the increase during the control period is practically the same as during the ozone period. Slight differences are of no significance. Hence, as regards appetite and body-weight the results of the test are negative, the ozone appearing to have neither a favorable nor an unfavorable influence. This applies also to the general conditions of the animals. The cats did not seem disturbed even when the ozone concentration approached one to a million, but this concentration caused some restlessness in the rabbits, guinea-pigs and rats. In all other respects the animals appeared to be normal.

We desire to state, however, that this test does not warrant the conclusion that the ozone concentrations that may be used in practical ventilation is harmless to man. Two weeks is a short time in the life of a man. If ozone in ventilation should come into general use, it would mean in the case of office- and shop-workers exposure to ozone from six to ten hours a day, six days of the week, from nine to twelve months of the year for from twenty to fifty years. And even if this prolonged exposure to ozone should prove harmless to the robust person, what about the unfortunate person whose lungs have only slight power of resistance?

[Review omitted.]

EXPERIMENTAL PROCEDURE

Our tests were conducted in the room used for the prolonged test on the animal groups. The room was of convenient size (26 cubic meters) and permitted adequate control of the rate of renewal of the air.

The following odorous substances were used: ammonia vapor, hydrogen sulphid, oil of cloves, asafetida, human feces, stale (or decomposed) urine, meat in advanced decomposition, musk, the odor of rose and the odor of lilac.

We aimed to secure comparable concentrations of the odors in the room by evaporating fixed quantities of the odorous material, and by exposing equal quantities of the odorous substances equal lengths of time. The rate of disappearance of the odors from the room under uniform conditions of the room ventilation was noted and this constituted our control. The ozone tests were made with reference to these three points:

1. The concentration of the ozone required to mask the odors.
2. The possible destruction of the odorous substances by ozone in strong concentrations.
3. The possible destruction of the odorous substances by ozone in concentrations just sufficient to mask the odors.

RESULTS

Our results agree with those of Erlandsen and Schwarz, Hill and Flack, and Konrich as regards the power of ozone in strong concentrations to mask all the before-mentioned odors. With the exception of ammonia and the oil of cloves all of these odors are completely masked by ozone below a concentration of one to a million. The masking of ammonia and clove oil requires a much stronger concentration of the ozone, a concentration sufficient to cause marked irritation and headache even on short exposure.

When the ozonator was allowed to run just long enough to cause complete ozone masking of the odors there was no appreciable destruction of the odorous substances by the ozone. The ozone odor disappeared before the specific odor under investigation, and the rate of disappearance of the latter was approximately the same as in the control tests.

Strong concentrations of ozone (from 2 to 5 parts to the million) hastened somewhat the rate of disappearance of the odors of feces, stale urine and decomposing meat. Strong concentrations of ozone are therefore capable of causing some destruction of these odorous substances. In the case of the other odors there was no evidence of actual destruction by ozone in concentrations up to 5 parts per million. Stronger ozone was not tried.

The inability of ozone to oxidize (to any appreciable extent) ammonia vapor and oil of cloves is very striking. These odors may be masked three or four times in succession during a single test, and the ozone disappear sufficiently for the specific odor to be smelled.

The mechanism of this masking action of ozone does not concern us here. Two factors appear to be involved. First, the preponderance of the powerful ozone odor in consciousness, and secondly, a fatigue of the olfactory end-organs by the ozone. Strong concentrations of ozone rapidly fatigue or anesthetize the olfactory epithelium. From 5 to 10 parts of ozone per million parts of air can be smelled for less than a minute despite its continued presence in the nose. After the first minute one is aware of the ozone irritation but not the ozone odor.

The assertion is frequently made by parties financially interested in the practical uses of ozone that "ozone destroys smoke." "Smoke" is composed of particles of carbon or soot plus various gases, such as carbon monoxid, sulphurous acid, etc., depending on the material burnt and the availability of oxygen during the process of combustion. But as ordinarily understood the word "smoke" means essentially particles of carbon or soot. And when the assertion is made that "ozone destroys smoke," the average reader takes that to mean that ozone destroys soot. Such an assertion is equivalent to a deliberate deception, because there is no evidence that ozone even in the greatest possible concentration can oxidize carbon particles suspended in the air in the form of smoke or soot. The inability of ozone to "destroy" carbon particles in the form of smoke or soot can readily be demonstrated by the following experiment: A piece of glazed paper is coated uniformly with a thin film of lamp-black or soot, the paper cut in halves, one part fixed in shellac for control, and the other part exposed to ozone. We have exposed such smoked paper 2 inches in front of the generator running at the highest concentration (10 parts per million) for ten consecutive hours without the slightest reduction of the amount of soot on the paper. If this is true in the case of ozone in very great concentration it must be true of ozone in concentrations that are permissible in actual ventilation.

SUMMARY AND CONCLUSIONS

In view of the evidence already in existence, the hygienic value of ozone in room ventilation would be hardly worth considering were it not for the persistent and sometimes extravagant claims made by the manufacturers and promoters of ozone generators.

So far as the destruction of bacteria is concerned, these claims have little or no foundation. Some bacteria are undoubtedly killed by ozone, especially if they are in a moist condition and are in contact for several hours with a current of ozone coming direct from the generator. In practice, however, the fact is of slight importance. Human beings are injuriously affected by amounts of ozone far less than are necessary to produce even this slight bactericidal effect, and there is no evidence for supposing that a quantity of ozone that can be tolerated by man has the least germicidal action. If disinfection of a closed room without inmates is desired, this can be much more effectively carried out by the use of formaldehyd or some other familiar gaseous disinfectant than by ozone. Ozone has no place in practical room disinfection.

Ozone is not an actual "deodorizer" in concentrations that can obtain in practical ventilation. In very great concentrations ozone seems capable of oxidizing some odorous substances so that the odors are diminished or changed, but the change may be in the direction of increasing the disagreeableness of the odor. In very great concentrations ozone "masks" most odors and possibly by fatigue or by its own intensive odo anesthesia of the olfactory epithelium. Certain odors are masked by ozone even in weak concentrations. Is such masking of odors desirable and generally advantageous? We think not. It is probable that the injury to the respiratory tract by ozone in sufficient concentration to act as an effective mask is of greater moment than the deleterious action of most odors. Except in special industrial processes, the unpleasant odor of the inspired air in shops, offices or living-rooms is usually a sign that the air needs to be renewed or changed as regards not only the percentage of odorous substances, but also, and of greater importance, the percentage of moisture and the degree of temperature. Why should we put out of commission the sense organ which aids us in determining whether or not the air is fit to breathe? It seems to us that this is wrong in principle, and that ozone is being used and will be used as a crutch to bolster up poor ventilating systems. Ozone does not make "pure air" any more than strong spices make pure food.

In concentrations that appreciably affect man and animals, ozone appears to have uniformly an injurious action. This injurious action is primarily on the respiratory passages—irritation of the sensory nerve endings, and irritation, corrosion and depression of the epithelial cells. The depression of the alveolar epithelium leads to changes in the gaseous exchange in the lungs, and secondarily to changes in the blood. The ozone headache is due to irritation, corrosion and consequent hyperemia of the frontal sinuses. The depression and drowsiness which are produced by ozone are due to the intense irritation of sensory nerve endings in the respiratory tract as well as to the secondary effects of the change in the activity of the alveolar epithelium.

Hill and Flack[7] point out that ozone gives a certain "tang" to the air, and thus relieves the impurity of the air (temperature and moisture) which is apt to obtain in the air in offices and assembly-rooms. This tang is a combined effect of ozone odor and the ozone irritation of the sensory nerves in the respiratory tract. We have seen that this acts (reflexly) on the vascular mechanism and it may temporarily "whip up" a fagged brain. But is this ozone tang any more beneficial or any more physiolgic than a whiff of smelling-salts or a puff of the cigarette? We recognize that a certain amount of variation in the rate of movement and in the temperature of the air about us aids in maintaining the tonus of the brain, but our ventilation engineers must reproduce the variability of outdoors by actual variations in the air and in the rate of movement of the air in the ventilating systems, and not by adding a poisonous gas to the air. Nor can we accept the suggestion of Hill and Flack that small amounts of ozone may be of therapeutic value in certain diseases of the respiratory tract by reason of the hyperemia following the ozone irritation. The ozone irritation leads to intense hyperemia of the respiratory tract, but this hyperemia is obviously correlated with repair of the injury to the epithelial cells wrought by the ozone. The cells injured by ozone are probably more readily invaded by bacteria, and have less than normal power of growth and healing despite the hyperemia. And all bacteria so far studied are much more resistant to ozone than are the cells of the respiratory tract of man and experimental animals. The physiology of ozone points to the conclusion that the use of this poisonous gas as a therapeutic agent is either valueless or injurious.

THE ALLEGED PURIFICATION OF AIR BY THE OZONE MACHINE *

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The experiments of a number of careful investigators have discredited the claims made for ozone as a purifier of air. Largely on the basis of claims already disproved, several manufacturers are so successful in introducing ozone machines into public buildings that this purposeful adulteration of the air with ozone and its accompanying impurities threatens to become a public health problem.

Ohlmüller[1] demonstrated that ozone in considerable strength was incapable of killing dry bacteria within the time-limits of his tests. Erlandsen and Schwarz[2] showed the falsity of the claim that the presence of free ozone means the absence of organic impurity in the air. They demonstrated, through careful analyses, that ammonia and hydrogen sulphid were not diminished in amount by the presence of ozone. They showed also that the deodorizing property of ozone consisted of the masking of one odor with another. In their experiments with a number of odorous substances, the masked odors again became evident when the odor of the ozone had diminished. Filipow[3] demonstrated that strong concentrations of ozone in respired air caused a marked irritation of the mucous membranes. Hill and Flack[4] showed that a concentration of ozone as small as one part per million was irritating to the respiratory tract and that exposure for two hours to fifteen or twenty parts per million was not without risk to life. They demonstrated that the respiratory metabolism was reduced by the inhalation of ozone.

In September, 1912, the fifteenth annual convention of the League of California Municipalities and the fourth annual conference of state, county, and municipal health officials were held on the campus of the University of California. In connection with these meetings there was a "Public Welfare Exposition" consisting chiefly of the exhibits of manufacturers. An attempt was made by the agent for an ozone machine (designated in this paper as "Machine A") to display his apparatus and literature in that part of the exhibit which was devoted chiefly to foods and was under the supervision of M. E. Jaffa, director of the State Food and Drug Laboratory. Jaffa refused to permit the ozone machine to be exhibited, on the ground that the advertising circulars made claims which could not be true. The decision was protested and was referred to the director of the Hygienic Laboratory of the California State Board of Health, who sustained it, laying special stress on the false claims of bactericidal efficiency for ozone. This action was repeatedly protested, and requests were made that the machine be given a laboratory test. As a result the few simple experiments reported in this paper were performed with the ozone machines of two well-known companies. It was proposed to show the relative killing power for animals and bacteria. No attempt was made to measure the quantities of ozone, oxids of nitrogen, or other gases, which may have been included in the composition of the "ozone" produced by the machines.

The machines examined were loaned for our tests by the local agents of the manufacturers, and we wish to express our appreciation of the uniform courtesy which was extended to us.

Machine A was intended for use in a large room containing about fifteen people. Unlike Machine B, it had no attached apparatus for agitating the air. Circulars put out by the manufacturers state that ozone is a "necessity" for the destruction of infectious germs and bacterial life, for the sterilization of air in operating-rooms, for the purification of the air in homes of persons suffering from contagious diseases, and for giving to offices and homes the invigorating air of the country, seashore and mountains.

Machine B also was intended for purifying the air of a large room. The machine included a motor and fan for blowing air through the apparatus and out into the room. A well-illustrated advertising pamphlet from the manufacturers includes the statement that ozone cannot exist except momentarily in air containing organic matter, and that therefore the presence of ozone is an indication that the air is sterile and devoid of organic matter. In a quoted article the pamphlet asserts that ozone is unique as a germicide by reason of the fact that it has no deleterious effect on the higher forms of animal life, owing to the low percentage of carbon contained in their structure.

For our experiments a tight wooden cabinet with a capacity of 1 cubic meter was constructed. The door of the cabinet had a glass window which permitted a view of the interior. The ozone machine under test stood in the middle of the cabinet. The humidity was indicated by wet- and dry-bulb thermometers. In some of the experiments the humidity of the air was increased by pouring hot water through a tube into a dish standing in the cabinet. The guinea-pigs which were subjected to the "ozone" were placed in a small wire cage where they could be seen through the glass door. The bacterial cultures used were grown for a day on meat-extract broth. Sterile glass rods were dipped into the cultures and the broth was dried on them in an almost invisible film. These rods were fixed in large corks and were inserted into the cabinet through holes drilled near the top. After exposure to the "ozone" the rods were withdrawn and their ends were dipped into tubes of broth. After forty-eight hours of incubation, the clouded cultures were tested to find whether or not the growth was due to the organism originally placed on the rod. The streptococcus and staphylococcus cultures in all instances showed organisms of the characteristic morphology. The typhoid cultures were tested by agglutination with antityphoid serum. The cultures of *Bacillus subtilis* were sufficiently identified by the appearance of the scum growing on the surface of the broth. In the tables the plus sign denotes that the organism exposed in the test grew in the subculture. The minus sign signifies that the subculture was sterile.

The experiments with Machine A were made in several separate tests, and the results are brought together in Table 1. The cultures which were dried on threads were placed in open Petri dishes on the bottom of the cabinet. The control cultures were exposed to the air in a locker in the laboratory.

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* From the Hygienic Laboratory of the California State Board of Health and the Laboratory of Hygiene of the University of California.

[1] Ohlmüller: Ueber die Einwirkung des Ozons auf Bakterien, Arb. a. d. k. Gsndhtsamte, 1893, viii, 229.

[2] Erlandsen, A., and Schwarz, L.: Experimentelle Untersuchungen über Luftozonisierung, Ztschr. f. Hyg. u. Infectionskrankh., 1910, lxvii, 391.

[3] Filipow, M.: Zur therapeutischen Bedeutung von Sauerstoff und Ozon, Arch. f. d. ges. Physiol., 1884, xxxiv, 335.

[4] Hill, L., and Black, M.: The Physiologic Influence of Ozone, Proc. Roy. Soc., London, Series B, 1912, lxxxiv, 404.

Guinea-pig 1 seemed sluggish and was breathing rapidly at the end of an hour. In two hours and forty minutes it was dead. Necropsy showed marked edema of the lungs.

The tests with Machine B were carried on both with and without added moisture. The various cultures and the guinea-pig were put into the cabinet and the machine was started at the time of beginning each experiment. The door was not opened until the test was finished.

Guinea-pig 2 showed labored breathing twenty minutes after the machine was started. Twenty-five minutes after beginning, it began rubbing its nose with its fore feet; after forty-five minutes it was drowsy; at the end of an hour its eyes were watery and almost closed, and its nose was wet. After an hour and a half its breathing was irregular and spasmodic. A little later there were convulsive movements. After an hour and forty minutes it was struggling for air and in an hour and fifty-five minutes it died. Necropsy showed marked edema of the lungs. They did not collapse and were filled with foamy fluid.

TABLE 1.—MACHINE A. FULL STRENGTH.

Cultures: 24-hour. Dried on glass rods and silk threads. Extract broth, 1 per cent. acid.

Dates: February and March, 1913. Moisture added to air. Humidity not measured.

Length of exposure to "ozone", hours	½	1	2	3	4	5	6	7	8	Controls in Air 8
Cultures on rods:										
Staphylococcus aureus	+	+	+	—	—	—	—	—	—	+
Staphylococcus aureus	+	+	+	+	—	—	—	—	—	+
Bacillus typhosus.	+	+	+	+	+	—	—	—	—	+
Bacillus typhosus.	+	+	+	+	+	+	—	—	—	+
Bacillus subtilis..	+	+	+	+	+	+	+	+	+	+
Bacillus subtilis..	+	+	+	+	+	+	+	+	+	+
Cultures on threads:										
Staphylococcus aureus	+	+	+	+	+	—	—	—	..	+
Bacillus typhosus.	+	+	+	+	+	+	+	+	..	+
Bacillus subtilis...	+	+	+	+	+	+	+	+	..	+
Guinea-pig 1.......		Sick		Dead						

TABLE 2.—MACHINE B. STRENGTH 3.

Cultures: 19-hour. Dried on glass rods. Extract broth, 1 per cent. acid.

Date: May 27, 1913. Time: Started 10:40 a. m. Moisture added to air.

Length of exposure to "ozone," hrs.	0	½	¾	1	2	3	4	6	8	12	Controls in Air 12
Temperature, centigrade ...	18	21	22	22	25	22	22	21	21	20	18
Relative humidity, per cent.	74	79	77	80	77	87	84	86	86	85	..
Cultures:											
Streptococcus pyogenes ..	..	+	+	+	+	—	—	—	—	—	+
Staphylococcus aureus ..	..	+	+	+	+	+	—	—	—	—	+
Bacillus typhosus...	..	+	+	+	+	+	—	—	—	—	+
Bacillus subtilis ...	..	+	+	+	+	+	+	+	+	+	+
Guinea-pig 2, 314 gm.		Sick			Dead						

As all the guinea-pigs showed similar symptoms during life and marked edema of the lungs on necropsy, details will be omitted in the subsequent experiments.

Guinea-pig 3 died four hours and thirty-three minutes after the machine was started.

Guinea-pig 4 died one hour and thirty-five minutes after the machine was started.

In a fourth test of Machine B the conditions were the same as those shown in Table 4, except that the machine was run at strength 1, instead of at the highest strength. The experiment was begun at 9:40 a. m., June 2. No moisture was added t[illegible]ir, and the average of the humidity estimations was 62.9 per cent., which is lower than the average (73 per cent.) of the readings in Table 4. The average temperature was 20.3 C. (68.5 F.), which is two degrees lower than the average during the previous test. A table of the results is not presented as the four kinds of bacteria withstood the entire twelve hours of exposure. The guinea-pig (weight, 325 gm.) died in less than one-eighth of that length of time. It showed disturbance of respiration almost immediately after the machine started and died one hour and twenty-five minutes later.

The agents for Machine B sent us another machine (C), which was similar to the other, although of lower capacity. When it was run at the greater of its two possible strengths, without the addition of moisture to the air of the cabinet, the results were similar to those presented in Table 3 for Machine B. This showed that the results obtained were not due to individual imperfections in one machine.

TABLE 3.—MACHINE B. STRENGTH 1.

Cultures: 24-hour. Dried on glass rods. Extract broth, 1 per cent. acid.

Date: May 28, 1913. Time: Started 9:45 a. m. Moisture added to air.

Length of exposure to "ozone," hrs.	0	½	¾	1	2	3	4	6	8	12	Controls in Air 12
Temperature, centigrade....	18	19	21	21	23	24	24	24	25	25	18
Relative humidity, per cent..	81	75	76	85	82	80	80	80	77	77	..
Cultures:											
Streptococcus pyogenes ..	..	+	+	+	+	+	+	+	+	—	+
Staphylococcus aureus	..	+	+	+	+	+	+	+	—	—	+
Bacillus typhosus ..	..	+	+	+	+	+	+	+	—	—	+
Bacillus subtilis ...	..	+	+	+	+	+	+	+	+	+	+
Guinea-pig 3, 712 gm.		Sick						Dead			

TABLE 4.—MACHINE B. STRENGTH 3.

Cultures: 19-hour. Dried on glass rods. Extract broth, 1 per cent. acid.

Date: May 29, 1913. Time: Started 9:40 a. m. No moisture added to air.

Length of exposure to "ozone," hrs.	0	½	¾	1	2	3	4	6	8	12	Controls in Air 12
Temperature, centigrade....	18	20	21	23	23	23	23	23	24	24	20
Relative humidity, per cent..	70	66	74	61	69	75	75	80	80	80	70
Cultures.											
Streptococcus pyogenes...	..	+	+	+	+	+	+	+	+	—	+
Staphylococcus aureus.....	..	+	+	+	+	+	+	+	+	—	+
Bacillus typhosus...	..	+	+	+	+	+	+	—	—	—	+
Bacillus subtilis ...	..	+	+	+	+	+	+	+	+	+	+
Guinea-pig 4, 277 gm.			Sick		Dead						

Comparison of the tables shows that the addition of moisture to the air in the cabinet increased the slight bactericidal effect of the "ozone." In every test in which the guinea-pig and the bacteria were in the cabinet together, the bacteria outlived the guinea-pig.

Additional tests of the bactericidal power of the "ozone" were performed in two bedrooms in a dwelling-house. A room containing 730 cubic feet of air-space was prepared by packing the spaces about the windows and doors with cotton. A similar room was used for exposing control cultures to the drying influence of air. In testing the ozone machines in the room the same varieties of bacteria were exposed as in the tests with the corresponding machines in the cabinet, and the cultures were dried on glass rods in the same manner. Machine A was run at its maximum strength for sixteen hours in the closed room. Subcultures were made when the room was opened, and the organisms grew in all instances. Machine B was run at its maximum strength (No. 3) for sixteen hours in the same room. The cultures all survived the test, but a guinea-pig (weight, 213 gm.), which had been put in a cage in the room, was found dead when the door was opened. Necropsy showed edema of the lungs. The humidity of the air in the room at the beginning of the test was 61 per cent. of saturation and the temperature was 22 C. (71.6 F.). When the room was opened in the morning a faint haze was visible in the air.

During these tests certain physiologic effects of the "ozone" were noticed by the experimenters after they had been working around the machines. The immediate effect of inhaling the diluted gas was a feeling of dryness or tickling in the nasopharynx, and sometimes the irritation was felt in the chest. If the exposure was prolonged, watering of the eyes, and occasionally a slight headache, resulted. The smell of the "ozone" and its irritation was much more noticeable to persons who came suddenly under its influence than to those who were continuously exposed. This shows the disadvantage of entrusting the regulation of an ozone machine to persons who are constantly breathing its products.

CONCLUSIONS

1. The gaseous products of the two well-known ozone machines examined are irritating to the respiratory tract and, in considerable concentration, they will produce edema of the lungs and death in guinea-pigs.

2. A concentration of the gaseous products sufficiently high to kill typhoid bacilli, staphylococci and streptococci, dried on glass rods, in the course of several hours, will kill guinea-pigs in a shorter time. Therefore these products have no value as bactericides in breathable air.

3. Because the products of the ozone machines are irritating to the mucous membranes and are probably injurious in other ways, the machines should not be allowed in schools, offices or other places in which people remain for considerable periods of time.

4. The ozone machines produce gases which mask disagreeable odors of moderate strength. In this way the machines can conceal faults in ventilation while not correcting them. Because the ozone machine covers unhygienic conditions in the air and at the same time produces new injurious substances, it cannot properly be classed as a hygienic device.

CAUSES, TYPES AND TREATMENT OF DIARRHEA IN ADULT LIFE[*]

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We have undertaken a fresh study of this ancient problem, beginning with the necropsy records of Bellevue Hospital in New York and the Massachusetts General Hospital in Boston. In each of these institutions we examined three thousand necropsy records, searching for lesions ordinarily supposed to produce diarrhea. We then traced the cases showing these lesions back to the clinical records, trying to ascertain first whether the lesions actually produced diarrhea, and if so, in what proportion of cases; secondly, whether any special type of symptoms or of discharges was associated with any special lesion of the intestine, the endeavor being to mark out clinical types so far as this was possible. Finally, we reviewed the results of treatment both in necropsy cases and in a considerable series of cases which did not come to necropsy, and endeavored to estimate the value of the different methods used.

For various reasons we have excluded from this study certain diseases often associated with diarrhea. We have taken no account of the cases of typhoid fever, partly because the relation of this disease to diarrhea has already been thoroughly studied in large groups of cases, and, secondly, because we were anxious to get some idea of the relative frequency of the different cases with this symptom, and we are well aware that the number of persons sick with typhoid in these two hospitals was not a fair sample of the number of cases of this disease existing in the community outside, since cases of typhoid are quite abnormally collected from large areas in hospitals such as those in which we have pursued our studies. The parasitic diarrheas have also been excluded because of the small number of these cases available in Boston or New York. We have made no effort to study the cases of mercurial or arsenical poisoning or cases of dysentery due to organisms of the Shiga type, or other organisms closely allied to it. We have also excluded all cases occurring in persons under 16 years of age. Leaving out the types just mentioned, we have studied 640 cases of the varieties ranged in Table 1.

TABLE 1.—RELATIVE FREQUENCY OF DISEASES CAUSING DIARRHEA IN ADULTS—MASSACHUSETTS GENERAL HOSPITAL, 1905-1912

Acute enteritis and unknown (acute) causes—clinical cases.		244
Acute enteritis—necropsied cases:		
"Primary"	9	
Secondary with and without intestinal lesions:		
Nephritic	10	
Cardiac	2	
Cardiorenal	2	
Arteriosclerotic	3	
Acute infectious	5	
Various acute and chronic conditions	10	
Intussusception	1	
		42
Acute enteritis total		286
Chronic enteritis and unknown (chronic) causes—clinical cases		139
Chronic enteritis, necropsied cases:		
Primary	8	
Cardiac	7	
Renal	1	
Cardiorenal	1	
Various chronic conditions	2	
		19
Chronic enteritis total		158
Cancer of bowel		52
Pernicious anemia		34
Mucous colitis		32
Exophthalmic goiter		25
Nervous diarrhea		17
Tuberculosis of bowel		15
Amebic dysentery		14
Fat intolerance		7
Total		640

DIFFICULTY OF DISTINGUISHING ACUTE FROM CHRONIC ENTERITIS AND COLITIS

It would have been desirable to distinguish clearly the acute from the chronic cases, but this we found unexpectedly difficult. The intestine is like the kidney in that a long-standing disease may show clinical symptoms only now and then, presenting itself suddenly under the guise of an acute disease.

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[*] Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

[*] Read in the Section on Practice of Medicine of the American Medical Association, at the Sixty-fourth Annual Session, held at Minneapolis, June, 1913.

After making these exclusions and explanations we turn to the first portion of our study.

CAUSES OF DIARRHEA

"Indiscretions in diet" have long been blamed for a large proportion of the brief diarrhea occurring in adults as well as in children. There is reason to doubt that these indiscretions are in a certain number of cases responsible, but a careful analysis of the records shows that many patients suffering from precisely the same symptoms as those supposedly due to indiscretions of diet have in fact committed no such indiscretions and eaten nothing unusual.

Among a group of eighty-nine patients suffering from acute benign diarrhea, presenting in the stools no evidence of bowel ulceration and recovering within from ten to fourteen days, forty-one patients ascribed the trouble to some supposed indiscretion in diet or to some food believed to have been poisonous, while forty-eight patients, exhibiting precisely the same symptoms, signs and course remembered no dietetic cause for their trouble and, indeed, no obvious cause of any kind.

"Ptomain poisoning" is one of the commonest, one of the most popular and fashionable diagnoses of the day among a certain class of practitioners. Yet this diagnosis will seldom stand criticism. Many of the cases to which this name is given turn out to be appendicitis, gall-stones, intestinal obstruction, pancreatitis, a gastric crisis in tabes, lead-poisoning and other diseases having nothing to do with ptomains.

We have merged in a single group a large number of cases variously designated on the clinical records because there seemed to be no good reason for the employment of the different terms such as dysentery, gastro-enteritis, enteritis, enterocolitis, colitis, etc. To the same group of cases, now one, now another of these terms is applied without any clear reason, according to the taste and fancy of the individual physician.

In a small group of cases, only seven, in the Massachusetts General Hospital series during a period covering the years from 1895 to date, there has seemed to be a genuine intolerance of the intestine for one or another foodstuff, chiefly fat. Intolerance for a protein or a carbohydrate was very rarely identified, but in the small group of cases previously referred to an excuse of fat was present in the stools on ordinary diet, and when a diet free from fat was given, the diarrhea ceased. In none of these cases was there any definite evidence of pancreatic disease or of any other organic cause for the anomaly, and no cases of diarrhea definitely to be referred to pancreatic disease were studied by us.

Passive congestion of the intestine is not a cause of diarrhea. This lesion was present in a large number of the cases of our series in which necropsy was performed, but was seldom associated with diarrhea.

Tuberculosis of the intestine is a favorite diagnosis among general practitioners confronted by intractable and chronic cases of diarrhea. In my experience such a diagnosis is almost never warranted, for it is likely to be made in patients showing no pulmonary lesions of tuberculosis and despite the well-known fact that tuberculous enteritis almost never occurs except as a complication of phthisis. A striking result of our studies was this: Even when there is a demonstrable tuberculosis of the intestine (complicating pulmonary disease) diarrhea occurs in only one case out of three. Thus in only ten out of thirty-one cases of tuberculous enterocolitis which came to necropsy at the Massachusetts General Hospital (32 per cent.) and in only twenty-nine out of one hundred similar cases studied post mortem at the Bellevue Hospital (29 per cent.) was diarrhea present. The two series of cases here support each other in a very striking way (Table 2).

Even when diarrhea occurs in patients suffering from distinct tuberculosis of the lungs, one is by no means certain that the flux is due to intestinal tuberculosis, for diarrhea is nearly half as common in cases of pulmonary tuberculosis without intestinal lesions as in cases with these lesions. Thus in 106 cases of pulmonary tuberculosis studied post mortem at the two hospitals referred to, fifteen, or 14 per cent., had diarrhea, although the intestines showed no lesions whatever. All this emphasizes the fact further to be insisted on that even when intestinal ulcerations are present in a case of diarrhea we are by no means certain that the ulcerations cause the diarrhea.

Cancer of the intestine was studied in 159 patients, post mortem or after operation, at the Massachusetts General Hospital, and in eighteen patients post mortem at the Bellevue Hospital. The percentage of diarrheas in these cases, taken as a whole, is almost identical with that found in tuberculous enteritis. Thus fifty-two, or 32 per cent., of the Massachusetts General Hospital cases showed a diarrhea either steadily or intermittently, while 22 per cent. of the Bellevue cases showed the same symptom. Contrary to the accepted idea on this subject, we did not find that diarrhea was any commoner in cases involving the lower part of the intestine than in those involving the upper part. Thus in forty-three cases of cancer of the rectum, diarrhea was present in 37 per cent., while in sixty-seven cases involving the hepatic flexure, the ascending colon or the cecum, diarrhea was present in 41 per cent. In thirty-two cases involving the intermediate portion of the colon including the transverse colon, the splenic flexure, and the descending colon (above the sigmoid), diarrhea was present in only 18 per cent.

In chronic renal disease, diarrheas of a supposedly compensatory type are often said to occur. Our studies did not tend to confirm this supposition, for in seventy-two cases of chronic nephritis diarrhea was present only eleven times either in the history previous to hospital treatment or during that treatment.

Intussusception has for many years been associated in text-books with a bloody diarrhea and been supposed to differ thereby from other types of intestinal obstruction.

TABLE 2.—RELATIVE FREQUENCY OF CERTAIN FATAL DISEASES ASSOCIATED WITH DIARRHEA (SIX THOUSAND NECROPSIES)

Disease	Bellevue Hospital 3,000 Necropsies		Mass. General Hospital 3,000 Necropsies		Per Cent. Having Diarrhea	
	Total Cases	No. of Cases of Diarrhea	Total Cases	No. of Cases of Diarrhea	Bellevue	Mass. Gen'l
Acute and chronic enteritis (unknown cause)	111*	45	71	32	40	45
Cancer of colon	18	4	64	20	22	32
Tuberculosis of intestine	100	29	31	10	29	32
Tuberculosis of the lungs; intestine not diseased	71	11	35	4	15	11

* Seventy classified as acute post mortem; twenty-five of these had diarrhea. Forty-one classified as chronic post mortem; twenty of these had diarrhea.

This idea was borne out only to a limited extent in the cases studied in the present series, for only three out of ten showed any diarrhea at all.

We have had no opportunity to advance our knowledge on the subject of so-called morning diarrheas, the association of which with achylia gastrica has recently been referred to.

Closely associated with these, according to our belief, is the type known as nervous diarrhea or simple hyperperistalsis. Presumably there is some connection here between the hyperperistalsis and low blood-pressure in the peripheral blood-vessels with vasodilatation in the splanchnic area. The feeble rapid heart and the tendency to faintness in such cases goes to strengthen this supposition.

An important group of cases, not very numerous, fortunately for us, but very obstinate and mysterious, are those associated with intestinal ulceration of unknown cause. Many of these cases are demonstrably nonamebic and not due to infection by any known type of micro-organism. Some of them bear the marks of infectious disease—fever, leukocytosis and albuminuria. In others there is no such evidence. The diagnosis is made from the condition of the stools (see hereafter) or by proctoscopy. Sixty cases of ulcerative colitis of this kind were studied at the Massachusetts General Hospital, beginning with the necropsy record and following the case back into the clinical history. One hundred and eleven similar cases were studied at Bellevue Hospital. In 55 per cent. of the Massachusetts General Hospital cases and 60 per cent. of the Bellevue cases diarrhea was absent, and the diagnosis of intestinal ulceration or ulcerative colitis was often quite unsuspected before necropsy. Even when the colon is deeply and universally ulcerated, "hanging in rags" as one of my colleagues expressed it, the bowels may be constipated throughout the disease. Although there is nothing new about this statement, we desire to emphasize it afresh, since there is so strong a tendency to use the words diarrhea and enteritis as synonyms.

In cases of enteritis without diarrhea the diagnosis is, so far as we can see, impossible, unless something suggests proctoscopy. There may be no local tenderness in the abdomen and nothing whatever to indicate the disease. This silence is only what we might have expected from the analogy of typhoidal and tuberculous ulcerations, which produce in the great majority of cases constipation rather than diarrhea. Thus in only 17 per cent. of the 1.495 cases analyzed by McCrae in Osler's "Modern Medicine" was diarrhea present, though in every case presumably the intestines were extensively ulcerated. The conditions existing in tuberculous enteritis have already been referred to.

Finally we would lay especial emphasis on the fact obvious from the study of the cases in this series, that in many, perhaps most, cases of diarrhea the cause is utterly unknown. No evidence of infection, ulceration, food poisoning, cancer or other disease can be found. In some of these cases we have evidence that the patient has been subjected to unusual overstrain, such as may well have lowered his powers of resistance or upset the vasomotor tone of his splanchnic vessels. Thus loss of sleep and overwork often appear to be causative factors; but the intermediate steps between these strains and the diarrhea are not clearly known.

TYPES AND DIAGNOSIS

Can we recognize what part of the intestine is affected? Many text-books describe symptom-groups supposed to characterize diarrheas originating in the small intestine and in the large intestine, respectively. We have not been able, however, to identify any diarrheas originating in the small intestine. If there is a characteristic symptomatology for such cases we have not been able to find it. As regards the portion of the colon affected by disease one can say only this: that the presence of marked tenesmus points almost certainly to inflammation of the rectum. Beyond this we cannot go with any certainty.

The study of the stools is of much importance, especially in prognosis. Cases in which blood and pus are frequently present in the stools are almost certainly associated with ulcers of the large intestine and run a much more chronic course than those in which blood and pus are absent from the stools. The presence or absence of mucus in the stools seems to be of little importance, especially when there is no other abnormality. Mucus is not proper ground for the inference that enteritis or ulceration is present. In many persons mucus is passed from time to time without any disturbance of the general health and without any known reason whatever.

An excess of fat, starch or protein in the stools is much less often of value in diagnosis or prognosis than the evidences of ulceration just referred to. In the routine examination of stools for causes of diarrhea such an excess of food products is distinctly infrequent and rarely characterizes a case for more than a short time.

Proctoscopy is of great importance in prognosis. The presence or absence of ulceration in the rectum and sigmoid can readily be decided by this method and, other things being equal, a much longer course can safely be predicted in cases showing ulceration of this kind than in those free from it. Thickening and infiltration of the bowel wall may also be recognized in this way and may furnish evidence of a long-standing, relatively intractable process. In nine cases of the Massachusetts General Hospital series the *Amoeba histolytica* was recognized in the stools and led to the identification of amebic dysentery. Such cases, however, are rare in Massachusetts even as importations. In parts of the country in which the *Amoeba histolytica* is common, stool examination may be of the greatest importance as a means of identifying diarrheas of this type, since it may lead to their treatment by the recently discovered specific, emetin.

Diphtheritic colitis or enterocolitis produces no characteristic symptoms and no recognizable abnormalities in the stools. This was proved by the clinical record of diphtheritic cases in which necropsy was performed at the Massachusetts General Hospital.

Mucous colitis or colica mucosa is, in our opinion, not a colitis at all, but a form of neurosis associated with constipation and sometimes with starvation. Of twenty-two cases of this disease studied at the Massachusetts General Hospital in only ten was diarrhea present at any time and, even in those, constipation was much more frequent. As a cause and a result of their neurosis many of these patients have acquired the disastrous habit of examining their stools themselves and it is almost pathognomonic of the disease if the patient produces a bottle in which curious materials have been accumulated as the result of the patient's own study of his dejecta. Habit and the mental attitude are the essential factors in these cases and will be further referred to under the section on treatment.

Prognosis.—The general measure of effectiveness in the treatment of chronic diarrheas of all types may be seen from the following figures drawn from the records of the Massachusetts general hospital: Out of ninety cases of diarrhea lasting over four weeks previous to hospital treatment, there were apparently cured fifty-four, or 60 per cent., and unrelieved (including deaths) thirty-six, or 40 per cent. We have called the favorable cases "apparently cured" because we have not often been able to follow their progress after discharge from the wards.

Further analysis of the results of treatment in twenty-five cases of chronic non-fatal diarrhea averaging about four years in duration shows that chronicity is not necessarily of bad prognostic import. It was found quite easy to check the process and even to cure it in twelve out of these twenty-five cases in which organic ulceration and infiltration of the bowel were not indicated by the presence of blood and pus in the stools or by proctoscopy. Chronicity then, does not necessarily mean intractability. Our fatal cases have rarely been chronic. They averaged less than *four months in duration. In contrast with this* were two cases diagnosed as nervous diarrhea and yielding readily to suggestive therapeutics, though they had lasted two years and five years, respectively.

Of thirteen patients with chronic ulcerated colitis, five were apparently cured, two were improved and six not improved at all.

Acute Diarrheas.—So far as duration measures severity, the non-ulcerated acute cases lasting five weeks or less were as severe as the ulcerated cases. The average duration of seventeen ulcerated cases (with blood and pus in the stools) was fourteen days before treatment began and thirty-eight days after treatment. In twenty-one non-ulcerated cases the average duration was thirteen days before treatment and twelve days after treatment.

The response to our therapeutic endeavors shows that the ulcerated cases were far more intractable. In seventeen out of twenty-one acute non-ulcerated cases, the movements ceased promptly after treatment by rest, diet and catharsis only. Three patients needed also saline irrigations and one bismuth. Opium and silver nitrate were never needed in this group of cases.

Of the seventeen ulcerated cases, on the other hand, only two yielded to rest, diet and catharsis alone. Three of these patients needed opium also, five needed bismuth, seven silver nitrate and eight normal saline irrigations. Three of the seven patients receiving silver nitrate had saline irrigations as well.

TREATMENT

The following experience has been frequently repeated in this series of cases and has left a deep impression on our minds: A patient seeks hospital care with a history of a most obstinate diarrhea which has persisted for months, even for years. He is put to bed in a hospital ward and before treatment is begun the preliminary investigation and preparation of his case occupy probably the first twenty-four hours of his stay in the hospital. During this time the remarkable fact is noticed that he has had no diarrhea, indeed that his bowels have not moved at all. In view of this fact no treatment for the previously troublesome diarrhea is instituted. One waits for the familiar symptom to appear; but it never appears. Day after day passes and finally the bowels have to be moved by enema or by a laxative. At first we interpreted the absence of diarrhea as a cure of the enteritis, but further observation of the patients, after they had left the hospital, showed that in many the diarrhea promptly reappeared as soon as the patient resumed his ordinary habits and occupation. In view of this it seems to us that one must interpret the disappearance of the diarrhea in such cases as due to the remarkable effect of lying in bed. And in fact lying in bed seems to us by far the most efficient and potent remedy at our command in a large number of the acute and the chronic diarrheas. Many of the patients just referred to had been treated unsuccessfully by every known method previous to entering the hospital, but had not remained in bed. That was the one thing that had not been done for them. How far this remedial effect of rest in bed is to be attributed to an effect on the splanchnic circulation we have no means of judging. It is well known that patients with diarrhea become faint, especially during and after the discharges. This faintness is doubtless associated with a low peripheral blood-pressure and it may be that rest in bed raises the average peripheral blood-pressure with a corresponding improvement in the splanchnic circulation. In some of these cases we have demonstrable evidence that the intestinal ulcerations associated with the diarrhea have shown no appreciable tendency to heal, even though the diarrhea itself has been wholly checked as a result of rest in bed.

The good results of purgation in all acute and benign cases are too familiar to need further emphasis. Our experience in this series of cases goes to support the traditional belief that purgation, by means of castor oil or magnesium sulphate, is second only to rest in bed as a remedy for diarrhea. We have seen no special reason to prefer one of these two purges to the other. Either is usually efficient. They are occasionally of value even in cases which have lasted for many weeks. But when definite ulceration is present in the bowel, purgation almost never gives more than temporary relief. Hence, the importance of proctoscopy and stool examination as a guide to treatment.

Diet.—For acute cases, from twenty-four to thirty-six hours' starvation with catharsis is the ideal treatment. Boiled milk has a long-enjoyed reputation, and many patients recover during (perhaps because of) its administration. In chronic cases it is the rule at the Massachusettes General Hospital to give a diet low in fats and carbohydrates.

Irrigations.—Daily irrigation of the lower bowel with warm normal saline solution seems to us of benefit in many obstinate cases. Astringents whether by mouth or by rectum have helped us little. Weak solutions of silver nitrate sometimes produce immediate benefit. If one injection does no good, it is not worth while to repeat it, especially as the remedy is always a painful one and occasionally makes the patient distinctly worse. Quinin injections for amebic dysentery deserve to be given up now that the use of emetin has been discovered. Injections of cooked starch or mucilaginous substances are useful to allay tenesmus.

Olive-Oil.—This substance has distinct value in the treatment of long-standing cases with or without ulceration. It has been extensively used in the Presidio Hospital at San Francisco for obstinate diarrheas in soldiers invalided home from the Philippines. We have used it successfully in doses of ½ ounce after meals in some ambulatory cases of chronicity, but have not yet distinguished the types most benefited or the method of its action.

Psychic Influences.—The good results produced by change of environment are, we suppose, mostly psychic. Morning diarrheas can often be promptly cured by a "change of air" and are sometimes very hard to cure in any other way. How far differences of food and of drinking-water may enter into this result is doubtful.

A most amazing result of a similar "change of air" was seen by one of us in 1898 when the hospital ship *Bay State* took on board from Porto Rican harbors 125 sick Massachusetts soldiers. Practically all of them were suffering from diarrhea of many weeks' duration and had become greatly discouraged and depressed. Within two days of their embarkation on a boat pointed for home, almost every man was free from diarrhea and eating ravenously of the two substances hardest to get in Porto Rico—bread and butter.

Drugs.—The subcutaneous use of emetin in amebic dysentery, as advised by Rogers, seems one of the most brilliant therapeutic results in the history of medicine. Our experience with this drug in a few cases wholly substantiates the reports of Rogers, Futcher, Bass and others.

Of opium we have nothing new to say. We all know its definite though limited value in acute cases, occasionally even in chronic cases to break up a pathologic habit.

Bismuth in doses of from 30 to 60 grains, from once to three times daily, seems to us of value in some obstinate cases when combined with rest and diet. The smaller doses formerly employed do not seem rational and have not been effective in our hands.

Sodium salicylate proved curative in one long-standing case which had resisted many other remedies.

Operation (Cecostomy).—Cecostomy and irrigation of the bowel, through the new hole, has been tried but little in our field of work and our experience does not warrant a definite opinion. Our impressions are not favorable.

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ABSTRACT OF DISCUSSION

Dr. W. S. Thayer, Baltimore: Dr. Cabot suggested that in a large proportion of cases of diarrhea it is not possible to say just what the cause is. How are we going to find out? One of the first things we ought to do, a thing which too many of us neglect, is to examine the stools carefully. We can obtain many hints as to treatment from the character of the stools.

I should like to emphasize one of the various causes of diarrhea, namely, a diminished gastric acidity, or anacidity. It is a common cause of rather long-persisting and annoying diarrhea. Annoying diarrheas are relieved by larger doses of hydrochloric acid than are generally given. In many of these cases one may expect to find a large proportion of fatty acid in the stool. We found many cases of imperfect fat absorption associated with diminished gastric secretion. Most of the acute diarrheas are due to greatly varying causes. In a large majority of cases it is impossible to say just what causes the attack.

We are familiar with the nervous attitude of individuals suffering from so-called mucous colitis.

These patients are extraordinarily interested in themselves, and this is an element we have to consider. A nervous element is an associated element, and is not the cause of mucous colitis. The onset of mucous colitis in some instances is almost like that of hay-fever. One of my colleagues whose work as instructor begins in the spring, for three or four years, at about the beginning of May, has become ill with mucous colitis and never recovers until he has finished his teaching in June. When he is suffering from overstrain he has an attack of colitis. In many instances the tendency toward mucous colitis depends on small local foci of infection, and the relief of those conditions is followed by so great an improvement that the mucous colitis recedes to the background. Mucous colitis is also, as Dr. Cabot has said, more commonly associated with constipation, with occasional outbursts of diarrhea, nothing like a continuous diarrhea. The important factor in the treatment of diarrhea of whatever type is rest in bed. It is the hardest thing to do. If we could make our patients go to bed at the outset and stay there for a day or two, often the disease would be ended. For the treatment of cases of subacidity, large doses of hydrochloric acid, from 20 to 30 drops, in a full glass of water, should be given three-quarters of an hour after meals, an hour and a quarter after meals and possibly again after that. The results in some instances are truly miraculous.

Dr. P. S. Roy, Washington, D. C.: I wish to emphasize the giving of hydrochloric acid in diarrhea. Hydrochloric acid controls, in great measure, the opening and closing of the pylorus. The pylorus opens and lets food into the duodenum, and then does not open again until the acid that goes into the duodenum is overcome by the alkalinity of the intestine; therefore, I think that the opening and closing of the pylorus often has a great deal to do with diarrheal attacks. In other words, hydrochloric acid prevents the pylorus from opening and closing too rapidly.

Another point I wish to call attention to is nerve fatigue. Many persons who are not nervous suffer from fatigue diarrhea. The diarrheal attacks which many, though careful in diet and habits, have when attending conventions are largely due to fatigue. I also think that the diarrhea of exophthalmic goiter is a *fatigue* diarrhea. Exophthalmic goiter is nerve fatigue. Rest will therefore do much to correct the diarrhea.

Dr. F. M. Pottenger, Monrovia, Cal.: Frequently when diarrhea develops in a patient having tuberculosis, the attending physician makes a diagnosis of tuberculosis of the bowel and gives a bad prognosis. I often find that it is only a simple diarrhea and that when these patients are put to bed and treated properly the trouble disappears. It is important to bear in mind that diarrhea in a patient with tuberculosis does not mean *dooming* a patient to tuberculous enteritis.

Another factor which should also be understood is that tuberculosis of the intestine is often present when no diarrhea is present. This is shown by Dr. Cabot's charts.

A point on diagnosis: We have made seven hundred examinations of the stools in tuberculous patients and find that about two-thirds of those who have tubercle bacilli in their sputum show bacilli in the feces, most probably from swallowed sputum, whether any symptoms of tuberculosis of the bowel are present or not. This shows definitely that the *finding of tubercle bacilli in the stools of patients having open* tuberculosis is not a diagnostic sign of tuberculous enteritis.

Dr. James S. McLester, Birmingham, Ala.: A form of diarrhea which is becoming increasingly frequent in the South and which is of more than local interest is that which precedes and accompanies pellagra. Not infrequently do we see a patient who first complains merely of diarrhea. Treatment accomplishes little. The following spring or summer other symptoms typical of pellagra appear. By noting the stomatitis and, perhaps, the exaggerated patellar reflex, we can at times recognize this form of diarrhea before the dermatitis develops. Examination of the stools is of no value. Bearing in mind the other nervous symptoms of pellagra, we might class this as a nervous diarrhea, and yet the coincident inflammation of all the mucous membranes suggests enteritis. On the other hand, all of these cases show much lowered gastric acidity—at times complete anacidity—which suggests even another cause of the diarrhea. Occasionally, the administration of large doses of dilute hydrochloric acid will check this distressing symptom of pellagra.

Dr. G. D. Head, Minneapolis: In Minnesota we have been much interested in this group of diarrheas of which Dr. Thayer has spoken. We class these as the achylia gastrica type of diarrheas. We can do much for these patients by giving them large doses of hydrochloric acid.

I wish to ask Dr. Cabot one or two questions. In the first place, I should like to inquire whether or not in this group of cases, that is, the so-called achylia gastrica type of chronic diarrhea, he finds any pathology in the bowel. In the second place, whether or not he finds an achylia gastrica in his cases of exophthalmic goiter with marked diarrhea. We know that in pernicious anemia, with and without diarrhea, there is a high percentage of achylia gastrica, and it occurred to me that the same condition might obtain in the cases of exophthalmic goiter with diarrhea.

Dr. Seale Harris, Mobile, Ala.: There is one form of diarrhea that Dr. McLester referred to, which is of much more frequent occurrence than is generally supposed, and that is the diarrhea of pellagra. I am sorry to say that there are a large number of cases of pellagra that are not recognized, in which the important symptom, and oftentimes the only symptom, is diarrhea.

The Italian death-rate from pellagra, as reported, is less than 4 per cent. In the city of Chicago, in 1911, nine deaths from pellagra were reported. My experience leads me to believe that the death-rate from pellagra in this country is certainly no greater than it is in Italy, and, therefore, in Chicago, or in the surrounding country, from which, perhaps, the cases were referred to Chicago for treatment, there must have been two or three hundred cases of pellagra, most of which were not recognized because the only symptoms were diarrhea and other digestive disturbances. I am sure that in the South and in the South Central states there are a great many cases of diarrhea due to pellagra that are ascribed to other causes.

Dr. H. F. Harris of Atlanta maintains that a large portion of the population in certain sections is suffering from what he calls corn intoxication, in which the only symptoms are diarrhea and other digestive disorders. I have seen a number of cases of pellagra without any skin lesion in which I have made a positive diagnosis, the diagnosis having been based on the diarrhea, the stomatitis, the red glossy tongue and the other digestive symptoms.

In my experience, in at least three-quarters of the cases of pellagra, in which diarrhea is an important symptom, there is lowered gastric acidity or absence of hydrochloric acid. Dr. Clarence Johnson of Atlanta called attention to the fact that in his series of cases of pellagra in which the skin lesions and other symptoms distinctive of pellagra were present and there was absence of or decrease in hydrochloric acid, there was diarrhea, and in those cases in which there was no decrease in hydrochloric acid, there was no diarrhea.

The treatment of diarrhea in pellagra is the same as in diarrhea from any other cause. Rest is most important, preferably in a dark room, because sunlight not only brings out the skin lesions, but also increases the diarrhea and other digestive symptoms.

In cases with gastric anacidity or lowered acidity large doses of hydrochloric acid are indicated. Most important of all is the diet; eliminate the corn products, corn bread, hominy, etc., and confine the diet largely to nitrogenous foods.

Dr. S. Bailey, Mt. Ayr, Iowa: I want to compliment Dr. Cabot for being an iconoclast. I am glad he has the honesty and bravery to attack a popular fad, ptomain poisoning. We have all been extremely disgusted with what we have been told and what we have heard about it. I believe, however, that it will scarcely recover from the body blows which have been and will be inflicted from this time on.

Dr. T. W. Stumm, St. Paul, Minn.: Undoubtedly the most important question to consider will be the cause of the diarrheal conditions. Regarding the cases mentioned by Dr. Thayer and Dr. Head, I should class them as gastrogenic diarrheas. Here in the Northwest we see many of these cases and we usually secure good results in cases of true achylia gastrica by the administration of hydrochloric acid, as Dr. Head suggests.

The other class of cases that we see are the cases of mucous colitis. They are frequently very troublesome. The patient is usually much run down in a general physical way and has been on special diet for months, and possibly for years. I have never seen any good result from placing these patients on a special diet. I am in the habit of telling my patients of this class to eat anything and everything—to take plenty of nourishment—bread, meat and potatoes. There are one or two things which seem to do good in a therapeutic way. One of these is belladonna pushed to the physiologic limit, given either hypodermatically or by the mouth. The second is the injection of cottonseed-oil or olive-oil per rectum; this is to be retained by the patient during the night. Some of the patients will retain a great deal of oil and others will retain only a small amount. This should be taken by the patient in a recumbent position when he goes to bed and as much oil should be injected as can be retained. With these two medicinal measures and a full general diet we can do a great deal for these patients. I class these cases as nervous cases entirely.

Dr. Richard C. Cabot, Boston: Our discussion seems to have centered mostly around two points, the diarrheas associated with achylia and mucous colitis, so-called. I think that the diarrhea of achylia is one of the most interesting types before us, but I do not think that it is nearly so simple as it appears. Take, for example, the achylia of pernicious anemia. That is the best-known form of chronic achylia. Pernicious anemia patients have diarrhea, but much more of the time they do not have diarrhea, and when they are not having diarrhea they do have achylia. The point we ought to realize is that, while achylia is without doubt a factor, it is only one factor. We must find the others before we really know what we are dealing with in these cases.

The morning diarrheas, like the mucous colitis cases, it seems to me, are best treated by the psychic method. I have seen cases of this kind cured more quickly in this way than in any other way. Many cases cannot be cured in any other way. The best kind of psychic therapy here is usually a change of scene with change of water and food—what we used to call a "change of air." I think the change of environment, the psychic change, is the big factor, and reliance on that often brings results just as good as, if not better than, hydrochloric acid does.

A great deal used to be said about degeneration of the gastro-intestinal mucosa in pernicious anemia, but the more these cases have been studied the less it appears that the gastro-intestinal changes are causes. There are no sudden changes in the gastro-intestinal tract in pernicious anemia associated with achylia.

I cannot answer the question in relation to exophthalmic goiter because my experience is limited. In some cases I have found achylia during the period of diarrhea, and in others I have not. I do not know the relation.

Coming back to mucous colitis: I do not suppose that any of us believe in purely psychic causes. We all believe that the body and mind necessarily always work together. When I say that I think that the cause of mucous colitis is a psychic cause, I mean that it is the sine qua non and the factor with which treatment has chiefly to deal. Remove that cause and you cure the patient; if you do not remove that cause you cannot cure the patient. Doubtless there are other factors, but the psychic factor, together with constipation and starvation, as has been emphasized, is the great factor. Some of the most impressive cures I have ever seen have been cures of mucous colitis, in which the patient has been dieted, as the doctor said, in a variety of ways, without any result. The essence of the treatment is encouragement and stuffing.

REPORT OF A CASE OF ACUTE NEPHRITIS IN AN INFANT WITH CONGENITAL HEART DISEASE *

H. M. McCLANAHAN, M.D.
OMAHA

History.—The infant, aged 1 year, came under my care Jan. 4, 1913. Family history negative. Parents both young and in good health. The patient had been a blue baby from birth. Breast-fed for a time. Ever since birth it had had an inspiratory grunt, more perceptible when the child was moved or held erect. Both skin and mucous surface constantly blue. The infant had steadily gained in weight, however, weighing 24 pounds at 1 year of age. Digestion had always been good, bowels regular, urine free.

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* Read in the Section on Diseases of Children of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

History of Attack.—Dec. 5, 1912, infant was suddenly taken sick with sore throat and fever, followed by a general erythematous rash. Later this rash was followed by a series of small vesicles. December 10 some swelling about the face was first noticed. The mother said breathing became more labored and rapid, so that she had to keep the child constantly in a recumbent position. Even then she noticed that the cyanosis was deeper in color. The bowels were regular, urine becoming more and more scanty as estimated by the napkins. Infant was more stupid than usual. Jan. 4, 1913, I noted the foregoing facts as given me by the mother. Temperature 100, pulse, 110, respiration 70. Child vomited two or three times a day while under my care, always after feeding. There were edema of the face, swelling of the arms and legs, and ascites, with pitting along arms and legs. Physical examination of the lungs negative. Pericardial dulness very extensive. Cardiac impulse perceptible. Blowing murmur heard everywhere over heart. Temperature did not go above 100 until a few hours before death. Respirations varied from 60 to 80 per minute.

Examination.—Urine examination January 5. Specific gravity 1.007, acid, albumin by heat and nitric acid, no sugar, no bile. Under the microscope a number of white cells, hyaline and granular casts. January 7: Examination the same with the addition of many blood-cells. Blood examination January 5: Red blood-cells, 8,140,000; white blood-cells, 20,000; hemoglobin, plus. Slight increase in small lymphocytes; otherwise leukocytes normal. January 7: Red blood-cells, 9,800,000; white, 16,000.

Treatment—There was nothing special in the treatment during the time that the patient was under my care. The infant responded well to hot packs. It received sodium carbonate by enema and tincture of digitalis by mouth. General anasarca decreased and quantity of urine increased. There were absolutely no nervous symptoms. Respirations continued rapid. Cyanosis extreme when infant was lifted up. Death was due to apnea.

Clinical Diagnosis.—Acute nephritis due probably to scarlet fever with congenital heart disease. I am satisfied that death was simply hastened by this disease, but was actually due to the heart lesion. In other words, the nephritis was an added burden that the heart could not carry.

Post-Mortem Made Four Hours After Death.—I desire here to thank Dr. L. Moon, intern at the Methodist Hospital, for his very thorough work in preparing the sections from various organs. The body was that of a large, well-nourished infant; slight eruption over body; chest appeared very large, no deformities, skin soft and very dark, mucous membrane dark, muscles flabby, no rigor mortis. Brain not examined. Skin of chest and abdomen quite edematous on incision. Muscles dark red and very soft. No free fluid in the abdominal cavity, no ossification in the costal cartilages. Sternum very soft and porous. Thoracic cavity contained 20 c.c. of light straw-colored fluid. No pleural adhesions. Base of heart at second rib. Apex at the sixth rib. Left border extended outside of nipple line ½ inch. Right border 1 inch to the right of the sternum. Thymus present, but no evidence of pressure on the trachea. Pericardium contained 10 c.c. of clear fluid. No adhesions. The heart was 13 cm. long, 9 cm. wide, 7 cm. thick. It will be noted that this is the size of the adult heart. Heart muscles dark reddish-brown. Cavities contained a large amount of fluid blood. It was noted that there was scarcely any clotting of blood in any organ. Veins of heart greatly dilated. Foramen ovale was open and large; indeed, there was only a light constriction between the auricles, so that both formed practically one cavity. Left auricle was greatly dilated with thin walls. The aortic and pulmonary orifices were smooth and the valves normal. The mitral valve was greatly shortened and thickened, and would not close to exceed one-half of the opening. There was also a defect in tricuspid valve. *Ductus arteriosus* was not found although carefully searched for. Pulmonary vessels filled with blood. It will be noted that there was practically free communication between all the chambers of the heart, no obstruction to flow of blood to lungs and that the aorta could carry a sufficient quantity to nourish the body, but that there was free mingling of the venous and arterial blood. The spleen was dark, congested and very vascular. Bile passages normal. Stomach dilated, also dark in color. Gall-bladder normal. Pancreas hard to touch, and dark in color. Liver 17 cm. long, 7.5 cm. thick, 12 cm. wide, dark in color, greatly congested, bleeding freely on section. Lungs dark in color but no evidence of bronchitis or pneumonia. Left kidney 7.5 cm. long, 5 cm. wide, 4 cm. thick. Right kidney 5 cm. long, 4 cm. wide, 2.5 cm. thick. Both kidneys were firm to touch and dark red on section and showed on section that they were retained by the capsule under pressure, capsule thickened. Bone-marrow of ribs and sternum very dark in color. The entire appearance was one of chronic passive congestion and the great size of the heart and liver was most striking.

Microscopic Findings.—Kidneys show a marked interstitial nephritis with chronic passive congestion. Many cells show hyaline swelling with fatty degeneration, capsule thickened. Marked round-cell infiltration in all fields.

Spleen shows marked congestion with great increase in the connective tissue.

Heart muscle is atrophic with cloudy swelling and evidence of fatty degeneration.

Pancreas shows great increase of connective tissue with marked passive congestion.

Liver capsule thickened, connective tissue increased and marked. Fatty infiltration about the center of the lobules.

Bile ducts dilated and increased pigment.

The pathologist, Dr. W. R. Lavender, reports that the sections of all organs show a passive congestion due to the congenital heart disease, with an acute process due to the complicating nephritis. This is in line with what is usually found in congenital heart disease with cyanosis.

There were two interesting features in the case:

1. Evidence of nephritis occurred earlier than is usual in scarlet fever. From a rather large experience in acute nephritis I think it is fair to assume that death would not have resulted if the infant had been normal. The absence of nervous symptoms with subsidence of the anasarca, increased excretion of urine, all pointed to a favorable termination.

2. The polycythemia. This is the second patient with congenital heart disease in whom I have found polycythemia. I have had the current literature for the last three years carefully reviewed without finding anything on the blood in infants with congenital heart disease. There are valuable contributions on the blood in scarlet fever and whooping-cough, but very little on the blood of infants. It seems reasonable to presume that polycythemia is physiologic in these cases; as the individual cell carries less oxygen, an increase in the number would carry relatively more oxygen. This would seem a reasonable hypothesis.

Brandeis Building.

ABSTRACT OF DISCUSSION

Dr. John Zahorsky, St. Louis: Several years ago I reported a case of polycythemia before the St. Louis Pediatric Society, in which the red cells numbered more than eight million. At that time I looked up the subject, and I am sure I found a condition described in which children with congenital heart disease showed an enormous number of red cells.

Dr. C. F. Wahrer, Fort Madison, Iowa: Is any mention made in the literature that this polycythemia is compensatory?

Dr. H. Lowenburg, Philadelphia: That polycythemia is a symptom of congenital heart disease is true, but it is not pathognomonic. I recall a case in which the count was about eight or nine million and in which there was clubbing of the fingers and a murmnur. This child died rather suddenly and came to necropsy. The heart was found to be normal, but there was a marked chronic interstitial pneumonia. My diagnosis was based largely on the murmur, clubbing of the fingers, dyspnea and polycythemia. I was wrong. The physical signs of interstitial pneumonia were lacking.

Dr. H. M. McClanahan, Omaha: I have looked in the archives for ten years and have found no literature on this subject. All patients with congenital heart disease whom I have ever seen ultimately die of some intercurrent affection. I have had one live to be 16, the oldest patient of whom I have any knowledge. These patients are especially prone to acute infections, and, if they have even a mild infection, it is most likely to prove fatal.

THE NATURE OF ILEOCOLITIS FROM AN ETIOLOGIC POINT OF VIEW*

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The term "ileocolitis," while originally a pathologic designation, has become distinctly clinical. No one, I think, will assert that all cases which show the clinical manifestations of ileocolitis are necessarily combined with the pathologic lesions which the term implies, and certainly not with the severe pathologic lesions which are commonly associated with it. It seems to me that the term ileocolitis conveys to the mind of most persons the clinical picture which follows in from twenty-four to forty-eight hours the acute stage of intoxication of alimentary origin. This period represents a symptom-complex which is more or less regular. The stools, while not so frequent as during the acute stage, contain much mucus and often blood. The temperature ranges usually between 99 and 101 F., prostration is great and the tolerance for food is markedly reduced.

It is this stage of acute attacks of summer diarrhea which offer so much difficulty in the solution of the problem and its cause. In general, three or four processes have been mentioned as possible causes of this condition.

The first is bacterial infection, which has received the greatest prominence at the hands of American pediatricians. "Bacterial infection" here does not mean the intoxication produced by decomposition products, the result of bacterial action on ingested food or its derivatives, but direct infection of the system through the intestinal wall. In this connection, two organisms have been more prominently mentioned, the *Bacillus dysentericus* of the Flexner type, and the streptococcus, and in by no means all of the cases are these two organisms found.

In order to explain the condition as a result of bacterial infection, it has been necessary to resort in some cases to the expedient of assuming that the *Bacillus coli* suddenly becomes pathogenic and causes the symptom-complex which is known as ileocolitis. No one, I think, will deny that no one organism is found in all these cases, nor that exactly the same clinical picture is produced regardless of the organism found in the gastro-intestinal tract. One should make the exception here of certain epidemics which have been reported from time to time, such as those caused by the Shiga bacillus, *B. pyocyaneus*, etc.

The chief reason for claiming pathogenicity for these organisms has been agglutination reactions in the blood. Whether agglutination can be regarded as direct evidence of the pathogenicity of that organism for a patient from whom the blood was obtained seems to me rather doubtful, since we know that such organisms as *B. coli* are agglutinated by normal blood in dilutions as high as 1 to 50. The mere presence of organisms of a doubtful pathogenicity in the feces and intestines of a child sick with ileocolitis certainly cannot be regarded as direct proof of the pathogenic action of these bacteria in a given case, and much more evidence must be brought to prove any such proposition.

The second process also has to do with bacteria, but in a decidedly different manner. In this process the bacteria act as agents decomposing the bowel content—more likely the proteid content of the bowel. The decomposition product thus formed would be regarded as toxic, and such product would produce this condition.

The theory of Kendall is certainly an ingenious one and deserving of our closest consideration. His clinical results, however, are not convincing and it is possible that his failure to obtain altogether satisfactory results may be explained by the fact that the bacteria producing the toxins continue their action below the point where the sugars are ordinarily absorbed and hence have the protein content of the bowel for the medium in which to grow. It should also be borne in mind when speaking of the protein content of the bowel that in the lower bowel this is composed in only a small part, if at all, of the proteid of the food, and there is no reason to think that the decomposition of the mucus produced in the bowel may not be carried on by the intestinal bacteria to as great a degree as is decomposition of the proteid. In this way it is easily conceivable that carbohydrates may increase the proteid content of the lower bowel.

Recent experiments have shown that volatile fatty acids, the product of fat and sugar decomposition, may be distinctly irritating to the intestinal mucosa, one result of which would be the production of mucus.

The third process is that of a metabolic disturbance produced by absorption, either of too great quantities of normal elements, or of elements which, as absorption products, may be regarded as abnormal. The chief advocate of this idea is Finkelstein, and his opinion, in part, is based on the fact that oral or subcutaneous administration of sodium salts or of sugar will produce a rise in temperature. Within the past year the experiments of Samelson, Bendix and Meigs have tended to disprove this theory. They were unable to produce a rise in temperature with sodium chlorid and sugar solutions made up from freshly distilled water. In other words, freshly distilled water did not contain some element which was present in the distilled water which had stood for some time, and this element, at present unknown, was responsible for the production of fever. It might be stated that this element in all probability does not consist of bacterial bodies.

While it has not been possible to produce rises in temperature with the salts and sugars when administered subcutaneously, it has never been disproved that salts and sugars when taken by mouth will produce such rises in temperature, but we must remember that in this case the proposition is an entirely different one. Here the sugars and salts traverse the alimentary canal and are subject to the action of the intestinal ferments and bacteria. It may be that in this instance only more favorable mediums for the growth of intestinal bacteria and the production of toxins are produced. Whatever may be the cause of the fever in this instance, one cannot feel the same security in ascribing to the salts and sugars the metabolic action which many of us have regarded as the potent cause of summer diarrhea.

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* Read in the Section on Diseases of Children of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

The fourth cause which may enter into this, but which probably affects rather the initial stage than the more chronic process, is heat. Just what position heat takes as an etiologic factor in summer diarrhea is by no means definitely determined. It seems reasonably certain that some cases of intoxication are really cases of heat-stroke, but further than this it is impossible to go at the present time.

It seems to me that in the present state of our knowledge it is impossible to decide definitely between these various processes, nor is it possible to assert whether or not the condition is due to the absorption of endotoxins of various bacteria unchanged through the intestinal wall. The fact that the clinical picture does not depend on the type of bacteria found in the intestinal content speaks strongly, to my mind, against the assumption of bacterial infection as a cause of the condition.

The disturbed metabolism as produced by the absorption of sugar unchanged through the intestinal wall is, in light of recent experiments, of rather doubtful value. A more convincing proof will have to be brought forward before it can be accepted as a cause of the condition.

This leaves us with little more than a theory, a theory championed most ably by Czerny and Keller in the discussion of the nature of "toxicosis," a theory which has little to support it in the way of experiments, but against which, at the same time, few objections can be raised.

I am disregarding heat because it certainly cannot be regarded as a prime factor in the later stages of ileocolitis. In considering the condition as an intoxication produced either by absorption of endotoxins or of decomposition products of bacterial metabolism, one must take more account than has been done in the past of the intestinal mucus as a medium for bacterial growth and the source of decomposition products. Theoretically, at least, it would seem that any factor which tends to increase the flow of the mucus, whether in the small or the large bowel, should, if possible, be eliminated.

Perhaps of all the foodstuffs the protein is least irritating and the easiest of absorption, and for this reason, if for no other, it would seem that when food is to be given to infants suffering with ileocolitis, a properly dosed protein food should be the first selection.

122 South Michigan Avenue.

ABSTRACT OF DISCUSSION

Dr. R. M. Smith, Boston: I am not yet convinced that bacteria do not play a part in the etiology of ileocolitis. I saw a large part of the clinical work on which Kendall based his conclusions. I feel sure that there is truth in his contention that different types of bacteria contribute to the variety of forms of ileocolitis The different response to different forms of treatment seem to me significant. The response is such as we would expect to receive if different bacteria played a part in the etiology. To illustrate, the cases of the group in which we are in the habit of assigning the dysentery bacillus as a cause respond favorably to the feeding of carbohydrates. We use sugar solution for this feeding. On the other hand, cases of ileocolitis in which the gas bacillus is the etiologic factor do badly when fed with carbohydrates, but do well when fed on a high protein diet. When the food furnished the individual is unfavorable for the development of the particular bacilli present, improvement in the patient is noticed. It seems to me that this different response to different treatment on the basis of a possible difference in bacterial etiology must be considered in this discussion.

Dr. E. W. Mitchell, Cincinnati: We should go away with a mistaken idea if we were to understand that bacteria did not play an important part in intestinal diseases. From the clinical side we have abundant evidence of the great importance of clean milk. By that I mean milk which has a low bacterial count. In my own city there has been an enormous change in the number of cases of sickness in babies in the summer time. I remember well when we attributed ileocolitis and other forms of intestinal trouble to the heat of the summer. Our summers have not changed in temperature; our hygienic conditions have changed for the better; people have learned much about the care of infants, but most important of all, there has been an enormous improvement in the cleanliness of our milk-supply. Those infants whom we feed throughout the summer on certified milk seldom show intestinal disturbance if they have ordinarily good care and if the milk is properly cared for at home. The remarks of Dr. Grulee are exceedingly suggestive as to the probable explanation of those cases which occasionally occur in children receiving a pure milk or children on the breast, and his explanation of why Finkelstein's theory would work out is suggestive. We all have had the experience that when we do use a fat-free milk we have far better results in the prevention of intestinal disturbances and in their more rapid cure. Perhaps Dr. Grulee also suggested a reason for this. In cases of intestinal intoxication it has been the fashion to give white of egg or albumin-water, with sometimes the result of symptoms suggestive of albumin poisoning.

Dr. J. L. Morse, Boston: I feel, as Dr. Smith has said, that our experience in Boston shows that different cases respond differently to treatment. What cures one patient will not cure another. On that basis we do feel that the bacterial etiology is important. It seems to me impossible to draw any absolute conclusions at present because our evidence is not as yet absolute. There is evidence on all sides. How to evaluate that evidence and what conclusions to draw from it has to be a good deal a matter of individual judgment and individual experience. I cannot quite agree with Dr. Grulee that the bacteria do not play an important part.

Dr. Clifford C. Grulee, Chicago: I did not say that bacteria do not play an important part in summer diarrhea. What I did say was that I do not believe that specific bacteria play an important part in summer diarrhea. The bacteria which are frequently accredited with being the cause of summer diarrhea, and especially the dysentery bacillus of the type ordinarily found — that is, the Flexner type, not the Shiga — has not been shown to be especially pathogenic. So far as I have been able to determine there have been a few experiments which have shown the pathogenicity of this bacillus to animals. The antidysenteric serum has proved a flat failure in the treatment of summer diarrhea of infants. The differences in opinion among Dr. Morse, Dr. Smith and myself are differences based on clinical results which cannot be eradicated unless we see the same set of cases. Other men have taken up the work of Dr. Kendall, and I think that I am fairly familiar with that work. I have heard him explain it himself. Others have had no results from the giving of sugar in cases of dysentery. One man followed this out clinicially and did not get the results that had been reported by Kendall. This is easily explained. One can never obtain as good results with a certain method as the originator of that method obtains. In the present state of our knowledge the only evidence of any value that we have for any specific bacterial cause for summer diarrhea comes from the work of Kendall, which is based on the clinical results obtained from different methods of feeding. As yet these results can scarcely be regarded as conclusive evidence.

Importance of the Dispensary.—In view of the vast field that it is called on to cover and the importance of its work, it is a curious fact that the dispensary is looked on almost invariably by boards of managers as the Cinderella of the hospital household. It is scarcely ever cared for properly, is seldom well equipped, and is almost always expected to be self-supporting.—Corwin and Mayo, in *The Outlook.*

ISOLATION OF THE TYPHOID BACILLUS FROM MILK WHICH CAUSED A TYPHOID OUTBREAK[*]

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AND
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The isolation of the typhoid bacillus from the milk during a milk-borne outbreak of typhoid fever is mainly of interest from the point of view of the general epidemiology of this disease. These findings merely add corroborative details to the well-established fact that milk at times serves as the medium of conveyance for typhoid to various groups of individuals.

The detection of this organism in milk also suggests the adoption of some technical method for the isolation of the typhoid bacillus from this fluid. Such a method, even when perfected, would never be used for the routine examination of market milk. It might, however, be of service in corroborating epidemiologic data in a suspected milk epidemic.

It would not be fitting in this paper to refer to the various milk epidemics of typhoid fever which have been recorded, but reference should be made to the rare cases in which the typhoid bacillus has actually been isolated from milk.

One of the first recorded instances of the isolation of the typhoid bacillus from milk was reported by Konradi,[1] who found this organism in two out of thirty-three samples examined during an outbreak at Kolozsvar. One of these samples was obtained from a bake-shop from which many of the cases originated, and the other sample was obtained from a dairy in which the farmer's son who was milking the cows had a mild attack of ambulatory typhoid fever.

The typhoid bacillus was also obtained by Shoemaker[2] from a specimen of milk which had caused eleven cases of typhoid fever. The various methods used for the identification of the organism are not stated in the article.

EPIDEMIOLOGY

The outbreak of typhoid in which the typhoid bacillus was obtained from the milk occurred in a suburban town in Maryland having 2,500 inhabitants.

In the latter part of July, 1912, 4 cases were noted, and these were followed by 23 cases in August, 19 cases in September and 10 in October, making 56 cases in all. Only 4 deaths occurred. Of the patients 26 were males and 30 were females; 49 were white and 7 were colored. Their ages ranged from 2 to 53 years, the greater number of cases, 5 in each instance, occurring at the age of 12, 17 and 22 years. But ten of the cases occurred in persons beyond 25 years of age.

The usual rate of attack of this town, computed from the years 1909 to 1911, inclusive, gave an average of 15.6 cases of typhoid fever during the four months of July, August, September and October, and, when this is compared to the larger number of 56 cases during the four months of July, August, September and October of 1912, it can be seen that this is an unusual condition, amounting to an outbreak of the disease.

As soon as the unusual number of cases for this town was noted by the State Board of Health, an investigation was begun, and water was soon excluded as a cause, since many of the patients used filtered water, furnished by a water company, which was found to have a very low bacterial count and to contain no colon bacilli. Many hundreds of persons in other towns and villages also used the water at the same time without showing an undue number of typhoid cases. The raw foods were also soon excluded, and it soon became evident that the milk of a certain milkman was the only common food which had been used by most of the victims of the disease.

On inquiry it was found that there were five milkmen serving milk to the citizens of the town and that the four milkmen who served approximately a thousand persons had only six cases on their routes, while the milkman from whose milk the typhoid bacillus was isolated and who served about fifteen hundred persons with milk had about fifty of the cases on his route.

A further investigation disclosed the fact that a woman in the dairy had suffered from typhoid fever two years previously, and that she had been handling the milk and dispensing it to customers. A specimen of the stools and urine was obtained, and from the former a typical typhoid bacillus was isolated. The feces were incubated for twenty-four hours in Conradi's bile-medium and then plated out in the Stokes-Hachtel[3] modified Hesse's medium. Typical concentric pink colonies were obtained, and when these were transferred to culture materials they conformed in all respects to the typhoid bacillus. These organisms were also agglutinated by known typhoid blood and typhoid immune serum, and the fact was thus established that a carrier had been working in the dairy. It was impossible to learn how long before the epidemic this woman had been handling the milk, but she was said to have taken a long rest after her convalescence from typhoid.

Owing to the large number of cases of typhoid fever occurring on the suspected milk route, five samples of milk were secured from the dairy and a thorough examination made for the typhoid bacillus.

TECHNIC

Each bottle of milk was thoroughly shaken and 10 c.c. inoculated into fermentation tubes containing lactose bile. At the end of twenty-four hours plates were made from these tubes on litmus-lactose agar and on the Stokes-Hachtel modified Hesse's medium. After incubation, colonies having the characteristics of the typhoid bacillus on these mediums were fished from the plates and inoculated into fermentation tubes containing dextrose bouillon. In all, about fifty colonies were fished from the various plates. The dextrose broth cultures were incubated for forty-eight hours, at the end of which time all tubes that showed the production of gas were discarded. Those cultures that did not produce gas were stained by Gram's method, and all Gram-positive organisms were next weeded out. The remaining cultures were inoculated on slant-agar, potato, blood-serum, and into litmus milk, stab-gelatin, bouillon and Dunham's peptone solution.

After hanging drops had been studied for motility, and the morphology and cultural characteristics of all the remaining cultures had been observed, only three were sufficiently striking in their characteristics as to be worthy of further study. These were Cultures 5, 9 and

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[*] From the Bacteriological Laboratory of the State and City Departments of Health, Baltimore.

[*] Read in the Section on Preventive Medicine and Public Health of the American Medical Association, at the Sixty-Fourth Annual Session held at Minneapolis, June, 1913.

1. Konradi: Centralbl. f. Bakteriol., 1905, Part 1, xl, 31.

2. Shoemaker, John V.: Endemic Typhoid Fever from Infected Milk, The Journal A. M. A., May 25, 1907, p. 1748.

3. Stokes, W. R., and Hachtel, F. W.: The Control of Typhoid Fever in City and Country, with a Description of a Modified Hesse's Medium for the Detection of the Typhoid Bacillus in Excreta and Fluid Foods, Arch. Int. Med., August, 1910, p. 121.

24. These three bacteria were morphologically and culturally like *Bacillus typhosus*. Repeated attempts, however, to secure agglutination with Organism 5 with typhoid immune serum at very low dilutions and with a number of known positive typhoid bloods were futile, and Culture 24 after about ten days developed a fluorescence, and both these organisms were also put aside. Culture 9, however, resembled *Bacillus typhosus* so closely in all its features that a careful study was made of it, which we shall describe in detail.

Morphology and Staining.—The organisms under the microscope appeared as straight rods with rounded ends, occurring singly, from about 1 to 3 microns in length by from 0.4 to 0.7 micron in width. They stained readily by the ordinary anilin dyes, were decolorized by Gram's method and contained no spores. Young agar and bouillon cultures were actively motile.

Cultural Characteristics.—The growth appeared on agar-slants as a uniform layer of translucent grayish-white growth. Bouillon showed a uniform turbidity. Gelatin stab-cultures were not liquefied at the end of six days at 37 C. (98.6 °F.). Litmus-milk showed very slight acidity at the end of twenty-four and forty-eight hours and six days. There was no coagulation. On potato the growth was visible only as a slight glistening moisture. No indol formed in Dunham's peptone solution. Blood-serum contained a uniform growth, the color of the medium. There was no liquefaction.

Agglutination Tests.—Agglutination tests were first made with ten known positive typhoid bloods at a dilution of about 1: 50. The tests were controlled by making similar tests at the same time with Laboratory Stock Culture 4. The results are shown in Table 1.

TABLE 1.—RESULTS OF AGGLUTINATION TESTS MADE WITH POSITIVE TYPHOID BLOODS—DILUTION 1:50

Typhoid Bloods No.	Culture 9 from Milk 24-Hour Bouillon Agglutination	Culture 9 from Milk 24-Hour Bouillon Motility	Laboratory Stock Culture 4, 24-Hour Bouillon Agglutination	Laboratory Stock Culture 4, 24-Hour Bouillon Motility
Controls no serum ..	0	+	0	+
1	+	0	+	0
2	+	0	+	0
3	+	+*	+	0
4	+	0	+	0
5	+	0	+	0
6	+	0	+	0
7	+	0	+	0
8	0	+	+	0
9	+	0	+	0
10	+	+*	+	0

* Slight.

It will be seen from the above table that Culture 9 from milk was agglutinated by nine out of ten positive typhoid bloods, although in two instances there was still slight motility present when the specimens were examined at the end of two hours.

A comparative agglutination test was next made with typhoid immune serum, laboratory stock typhoid bacillus being used as a control. The results are shown in Table 2.

TABLE 2.—RESULTS OF AGGLUTINATION TEST WITH TYPHOID IMMUNE SERUM

Dilution of Serum	Culture 9 from Milk 24-Hour Bouillon Agglutination	Culture 9 from Milk 24-Hour Bouillon Motility	Laboratory Stock Culture 4, 24-Hour Bouillon Agglutination	Laboratory Stock Culture 4, 24-Hour Bouillon Motility
Controls no serum ..	0	+	0	+
1:10	+	0	+	0
1:20	+	0	+	0
1:40	+	0	+	0
1:80	+	0	+	0
1:160	+	0	+	0
1:320	+	0	+	0
1:640	+	0	+	0
1:1,280	+*	0	+	0
1:2,560	0	+	0	+

* Incomplete.

A rabbit was immunized with a vaccine made from Organism 9, from milk, by injecting six doses, the first two of 500 million, the third of 1,000 million, and the last three 4,000 million dead organisms at intervals of ten days between doses.

Agglutination tests were made with serum obtained from this rabbit and twenty-four-hour cultures of Organism 9, from milk, Laboratory Stock Typhoid Culture 4, paratyphoid bacillus (alpha) and paratyphoid bacillus (beta), with the results tabulated in Table 3.

TABLE 3.—RESULTS OF AGGLUTINATION TESTS MADE WITH SERUM OBTAINED FROM IMMUNIZED RABBIT AND VARIOUS CULTURES

Dilution of Rabbit-Serum	Culture 9 Ag.	Culture 9 Mot.	Culture 4 Ag.	Culture 4 Mot.	Paratyphoid (Alpha) Ag.	Paratyphoid (Alpha) Mot.	Paratyphoid (Beta) Ag.	Paratyphoid (Beta) Mot.
Serums ..	0	+	0	+	0	+	0	+
1:20	+	0	+	0	+	0	+	0
1:40	+	0	+	0	++	+	+	0
1:80	+	0	+	0	++	+	0	0
1:160	+	0	+	0	0	+	0	0
1:320	+	0	+	0	0	+	0	+
1:640	+	0	+	0	0	+	0	+
1:1,280 ...	+	0	+	0	0	+	0	+
1:2,560	+	0	+*	0	0	+	0	+
1:5 120 ...	0	0	0	0	0	+	0	+
1:10,240 ..	0	0	0	0	0	+	0	+

* Slight.

The table shows that the serum obtained from the rabbit immunized with Typhoid Bacillus 9 from milk is capable of agglutinizing Laboratory Stock Typhoid 4 at very high dilutions. It also agglutinates both alpha and beta paratyphoid at low dilutions.

Absorption tests were next made by saturating a portion of the serum obtained by immunizing a rabbit with Culture 9 from milk with cultures from Laboratory Stock 4 and Milk Cultures 9. Agglutination tests were made with the serum saturated with Culture 4, with the twenty-four-hour bouillon cultures of both Culture 4 and Culture 9. No agglutination was obtained at a dilution at 1: 20 (lower dilutions were not made). Likewise the serum saturated with Culture 9 was tested for its agglutinative properties by both organisms with like results.

Complement-fixation tests were next made with the serum obtained from the rabbit immunized against Organism 9 from milk, using Laboratory Typhoid Culture 4 as antigen in one set of experiments and Milk Culture 9 as antigen in the second experiment. Complete fixation of complement occurred with Organism 9 from milk with 0.05 c.c. of serum. In the experiment in which Organism 4 was used complete fixation occurred with 0.025 c.c. of the serum.

The bactericidal activity of the serum obtained from the rabbit immunized against Culture 9 from milk was determined for both Organisms 4 from stock and Organism 9 from milk. The experiments were made *in vitro,* according to the method originally devised by Neisser and Wechberg. The results of the experiments are given in Table 4.

TABLE 4.—RESULTS OF COMPLEMENT-FIXATION TESTS MADE WITH SERUM OBTAINED FROM IMMUNIZED RABBIT AND VARIOUS CULTURES

Dilution of Serum	No. of Organisms on Plates Made with Culture 9	No. of Organisms on Plates Made with Culture 4
Undiluted	12,600	4.200
1:2	7,200	8,700
1:4	1,000	8,600
1:8	60	1,800
1:16	0	1,400
1:32	4	600
1:64	2	6
1:128	2	15
1:256	15	5
1:512	1	8
1:1,024	8	300
1:2,048	1,230	900
1:4,096	7,680	3.000
1:8,192	9,600	2,400
1:16,384	5,400	3,000
1:22,768	78,000	3.000

The number of Organisms 9 seeded into each tube, as shown by Control Tube 1, which was not incubated, was 11,000. The number or organisms in Control 2 which was incubated three hours was 60,000. The complement control plate contained 2,000 bacteria.

The number of Organisms 4 seeded into each tube, as shown by Control Tube 1, was 10,000. Control 2, which was incubated for three hours, contained 96,000 organisms, and Complement Control 3 contained 8,500 bacteria.

SUMMARY OF THE SEROLOGIC TESTS

The first set of agglutination tests described in Table 1 shows that the organism obtained from milk would agglutinate with a number of different samples of known typhoid blood, and the tests described in Table 2 show that this organism would also agglutinate in comparatively high dilutions with an immune serum made from a known typhoid bacillus. The agglutination tests described in Table 3 show that a serum prepared by injecting an animal with the organism obtained from milk will agglutinate a known typhoid bacillus in nearly as high a dilution as that obtained with the milk organism itself. This table also shows the phenomenon known as the "group" agglutination, since it can be seen that the milk typhoid serum will agglutinate both the alpha and beta paratyphoid bacilli in low dilutions.

The absorption tests made by saturating the serum of the animal immunized with the culture obtained from the milk show that the antigen prepared from the typhoid bacillus obtained from milk is capable of binding all of the typhoid agglutinogen or receptors with which the agglutinin combines. When these receptors had combined with all of the agglutinin in the blood-serum, this serum was no longer able to produce agglutination of a known typhoid bacillus or of the suspected typhoid bacillus obtained from the milk.

The same experiment was performed by using a known typhoid bacillus as the antigen, and all of the agglutinin was again abstracted from the immune serum made from the milk typhoid bacillus.

The complement-fixation tests also show that the antigen made from the typhoid bacillus obtained from the milk, as well as from a known laboratory typhoid bacillus, was able to produce complete complement-fixation by combining with the amboceptor in the immune serum made from the milk typhoid bacillus.

The bactericidal tests described in Table 4 show that the amboceptor contained in the immune serum made from the milk typhoid bacillus is able to bind the complement to known typhoid bacilli as well as to the milk organism, producing marked bacteriolysis in the dilutions, which are set forth in the table. The failure of the lower dilutions to destroy the typhoid bacillus in both cases corresponds to the phenomenon already described by Ehrlich and known as the "Neisser-Wechberg phenomenon." In this reaction when an excessive amount of amboceptor is used the complement is not bound to all of the typhoid bacilli, and these escape destruction and later multiply rapidly.

These experiments, therefore, show that the antigen of the milk typhoid and the antigen of the known laboratory typhoid bacillus correspond in all of their serologic characteristics and completely confirm the cultural tests, which are all characteristic of a typical typhoid bacillus.

PATHOGENIC PROPERTIES

In order to test the pathogenic properties of the typhoid bacillus isolated from milk the organism was injected into the peritoneal cavity of three guinea-pigs. A quantity equivalent to about 4,000 million live typhoid organisms from a twenty-four-hour growth on blood-serum was used for injecting each animal. It is a well-known fact that the typhoid bacillus is often variable in its effect on animals, and this organism did not prove to be very virulent. Two of the guinea-pigs recovered from this injection, but the third animal died in twenty-four hours, and the necropsy showed an extensive fibropurulent peritonitis. Cover-slips from this exudate showed nothing but Gram-negative, typhoid-like bacilli and a few pus-cells. Cultures from the peritoneal cavity, the liver and the spleen showed numerous colonies of the typhoid bacillus. The injection in this one animal, therefore, produced purulent peritonitis and a general bacteriemia, thus showing that the organism was pathogenic.

METHODS USED TO CONTROL THE EPIDEMIC

After the discovery of the carrier case in the dairy the place was closed, September 28, and in about ten days from this time the epidemic had practically ceased. It should not be thought, however, that this result was entirely due to this one act, since an investigation of the water-supply of a certain percentage of the citizens showed a most remarkable condition of affairs. These persons obtained their drinking-water not from the water company furnishing pure water, but from shallow or deep wells, almost all of which were polluted either by adjoining cesspits or box toilets.

A large number of chemical and bacteriologic examinations of water were made and almost all of the wells were found polluted, either bacteriologically or chemically. These examinations were made from September 25 to October 21, inclusive, and it can be seen that the epidemic had then already been under way for two months. Owing to this reason it is very difficult actually to separate the water-borne from the milk-borne cases; but the almost exclusive distribution of the cases to one milk-route would seem to indicate that the typhoid bacilli from these cases had not penetrated the soil to a sufficient extent to actually introduce typhoid bacilli into many of the drinking-wells.

After having discovered the remarkable condition of saturation of the subsoil with the seepage from the cesspits it was determined to disinfect these pits by calcium hypochlorite. It was found that there were two hundred cesspits in this small town, and about 20 pounds of calcium hypochlorite were added to each one of these pits. The pools and gutters in the town and on the outskirts were also disinfected.

It is impossible to say whether or not this disinfection had its share in stopping the outbreak, but it seems reasonable to believe, from the results of the chemical and bacteriologic examinations, that there must have been fairly constant communication between the polluted material in the pits and the drinking-water from many of the wells. At least, the epidemic practically ceased after the first week in October, and the removal of the carrier case from the dairy, as well as thorough disinfection of the cesspits, can both be regarded as having aided in preventing the further spread of the disease. The handles were removed from most of the pumps connected with these drinking-wells, and this also had its effect in preventing the further spread of infection.

SUMMARY

1. The first point of interest in this study consists in the isolation of a typical typhoid bacillus from the milk which caused a milk-borne outbreak of typhoid fever.

2. The study is also of interest as demonstrating the relation of infected milk to the epidemiology of typhoid, and contains the methods by which the cause of the outbreak was recognized and by which its further spread was averted.

We are indebted to Drs. Frederic V. Beitler, C. W. G. Rohrer and W. B. D. Penniman for much information and aid in preparing this paper.

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THE TREATMENT OF DIPHTHERIA CARRIERS [*]

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In this paper I shall consider the treatment of diphtheria carriers with the idea of ridding them of the specific germs. The paper will not comprehend the treatment of the diphtheria patient nor will it deal with the problem of isolating or otherwise protecting others from the carrier.[1]

The necessity for the treatment of carriers with the idea of getting rid of the diphtheria bacilli is obvious when we consider the frequency of the carrier condition and the length of time that the condition often continues. After the clinical symptoms of the disease have disappeared, the patient is ready to be released from quarantine, but the interests of the public health demand that he shall not mingle with the general public while he still carries the germs of the disease.

NUMBER OF DIPHTHERIA CARRIERS

According to Ledingham,[2] 50 per cent. of persons affected by diphtheria have lost the bacilli by the time the local membrane has disappeared. Of those harboring diphtheria bacilli after the throat had become healthy in appearance, Scheller[3] found that 77 per cent. still had the bacilli at the end of eleven days after the throat had become normal in appearance; 35 per cent. at the end of twenty-one days; 18 per cent. at the end of thirty-one days; 5 per cent. at the end of two months, and 2 per cent. at the end of three months. Considering that these figures apply only to the 50 per cent. of patients who still have diphtheria bacilli after the throat has become clear, it means that if we took as a basis the total number of cases of diphtheria, the percentage figures would be only one-half those given. My own figures are slightly different.[4] I found that of all cases of diphtheria, 41 per cent. were free from diphtheria bacilli by the end of the second week after the beginning of the disease; 73 per cent. at the end of the third week, and 99 per cent. at the end of the fourth week.

Of the general population who have not been affected by the disease, 1 or 2 per cent., under ordinary conditions, and from 5 to 10 per cent. during epidemics of the disease are "carriers" of the germs. They retain the bacilli for about the same length of time, on an average, as convalescents from the disease.

VIRULENCE OF BACILLI IN CARRIERS

The virulence of the diphtheria bacilli seems to be but slightly lessened during the carrier condition even though the condition persists for a long time and is completely lost (as determined by the ordinary tests) in only a small proportion of the cases. It is therefore quite obvious that with but few exceptions a carrier can transmit the disease as long as the carrier condition remains. It is also probable that the carriers are responsible for more cases of the disease than are those affected by the disease itself. This certainly seems to be the case if we include among the carriers those with slight evidence of local inflammation, but presenting no obvious general symptoms and whose condition is not diagnosed clinically as diphtheria.

LOCATION OF THE BACILLI IN THE CARRIER

In general we may say that the nose and throat are the places in which the diphtheria bacilli are to be found. On that basis, the release from quarantine for diphtheria is based, almost the country over, on negative findings of swabbings from the nose and throat. Swabbings taken from both and cultivated separately indicate that, when dealing with well persons, the bacilli are found more frequently in the nose than in the throat.[5] These findings are the results of surface swabbing. The result will probably be different, if the swab, instead of being used on the surface of the tonsils, is introduced into the crypts of those structures.

It seems improbable that the diphtheria bacilli will remain and continue to grow for any great length of time on the rather smooth mucous membrane which covers the greater part of the nose and throat; rather do I believe that their home is in little pockets here and there from which there is not a sufficient stream of mucus to dislodge them. Such pockets may be represented by the crypts of the tonsils, the fissures of the adenoids, the spaces about the turbinates, and the sinuses connected with the nasal cavity.

The finding by Beyer[6] of diphtheria bacilli in the urine in every one of nineteen children examined from four to fourteen weeks after they had apparently recovered from diphtheria should cause further investigations of this phase of the subject. If his report is generally confirmed, it will have an important bearing on public health, especially with reference to milk.

METHODS OF RIDDING CARRIERS OF THE BACTERIA

Many methods have been used to get rid of diphtheria bacilli. These have consisted of liquid antiseptics applied with cotton, sprayed or gargled; inhalations of antiseptic vapors; use of diphtheria vaccine, toxin, antitoxic and antibacillary serum, toxins of the *Bacillus pyocyaneus*, and finally the use of cultures of staphylococci.

1. *Use of Liquid Antiseptics Applied by Means of a Cotton Swab.*—These are applied, of course, only to the throat (tonsils and pharynx). They consist of such liquid antiseptics as a weak solution of phenol (carbolic acid), glycerin, with 3 per cent. iodin, and 5 per cent. solutions of silver nitrate. As ordinarily performed, the antiseptics are applied only to the exposed surfaces of the throat, no effort being made to get into the crypts of the tonsils. I shall refer to these later.

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[*] Read in the Section on Preventive Medicine and Public Health of the American Medical Association, at the Sixty-Fourth Annual Session held at Minneapolis, June, 1913.

[1] The principles concerned with the protection of others from the carriers are considered in an article by Albert, Henry: Diphtheria Carriers and Their Relationship to Medical Inspection of Schools. Am. Jour. Pub. Health, ii, No. 10.

[2] Ledingham and Arkwright: The Carrier Problem in Infectious Diseases, 1912, p. 203.

[3] Scheller: Centralbl. f. Bakteriol., Orig., 1906, xl, 1.

[4] Albert, Henry: Diphtheria: A Statistical Study of Certain Laboratory and Clinical Observations, Jour. Infect. Dis., 1907, iv, 210.

[5] Report on Diphtheria Bacilli in Well Persons, by a committee of the Massachusetts Association of Boards of Health, Jour. Massachusetts Assn. of Boards of Health, July, 1902.

[6] Beyer, W.: Diphtheria Bacilli in the Urine, München. med. Wchnschr., 1913, lx, No. 5.

2. *Use of Liquid Antiseptics Applied by Means of a Spray.*—These may be applied to both nose and throat. The following fluids have been used with greatest success: Seiler's solution; Dobell's solution; hydrogen peroxid of 0.5 per cent. (by weight) strength. Any of these solutions are found to be too irritating for many persons.

It is probable that sprays are more efficacious than liquids applied by means of a swab in the ordinary way. Nevertheless sprays do not reach the recesses in which it is most probable that diphtheria bacilli find their hiding-places.

3. *Use of Liquid Antiseptics Applied by Means of Gargles.*—These are probably more effective for the throat than either swab applications or sprays. The liquid that has probably given the best results is hydrogen peroxid in from 0.5 to 1 per cent. strength (the ordinary commercial hydrogen peroxid solutions are of about 3 per cent. strength). Solutions of sodium chlorid and Seiler's solution have also been used. The liquid used as a gargle may also be used as a mouth-wash.

4. *Inhalations of Antiseptic Vapors.*—The following method was used by the French army, in 1910, for the disinfection of the nasopharynx: A mixture is prepared of iodin, 12 gm.; guaiacol, 2 gm.; thymol, 25 gm., and alcohol (60 per cent.) 200 c.c., to which are added 6 gm. of potassium iodid to aid in the dissolving of the iodin. This mixture is placed in a porcelain dish and the dish floated in a basin of boiling water. The person whose nasopharynx is to be disinfected should sit with head bent over and nose a few inches distant from the porcelain dish, and inhale the fumes by breathing slowly through each nostril. There should be five sittings in twenty-four hours, each sitting to last two or three minutes. I have not yet seen any statistical data of the effect of this inhalation treatment on diphtheria carriers. This and other inhalations are worthy of much more extensive trial.

5. *Diphtheria Antitoxin.*—The use of antitoxin administered either by hypodermic injection or by the dissolving of tablets in the mouth seems to have no effect in getting rid of the bacilli.

6. *Antibacillary Diphtheria Serum.*—Some good results have been reported from the use of antibacillary diphtheria serum applied locally. The evidence of its value is, however, very unsatisfactory.

7. *Diphtheria Vaccine.*—Vaccines of dead diphtheria bacilli were first used with the view of curing the carrier condition by Petruschky[7] in 1908. Five of his six cases seemed to respond favorably to the treatment. Similar results suggesting that vaccines are of some value were obtained by Hall and Williamson[8] in 1911 and by Forbes, Duncan and Newsholme[9] in 1912.

8. *Diphtheria Toxin.*—Hewlett and Nankivell[10] report a reduction in the time that diphtheria bacilli can be found in the nose and throat after an attack of the disease by the hypodermic injection of diphtheria endotoxin, beginning with a dose of 2 mg., followed at the end of a week or ten days, if necessary, with an injection of 5 mg.

9. *Staphylococcic Culture (Living) Sprayed into Nose and Throat.*—In December, 1909, Schiötz,[11] a Danish physician, described a method of freeing throats from diphtheria bacilli which seems destined to be a procedure of considerable importance. It has proved successful in about forty reported cases in which other measures failed, and so far no unfavorable results have been reported. Schiötz obtained his suggestion from the fact that a person with a staphylococcic sore throat placed in a diphtheria ward under a mistaken diagnosis did not contract diphtheria. He also found that the germs disappeared on the development of an ordinary staphylococcic sore throat, from several patients in whom, after recovery from diphtheria, the specific bacilli persisted for some time. He reported the treatment of six cases with the staphylococcic culture obtained from the throat of a healthy person. The diphtheria bacilli disappeared after one inoculation of the throat of a man who had been detained in the hospital for three months as a diphtheria carrier, and of a woman who had likewise been detained for two months. The other patients who had had diphtheria more recently recovered from the carrier condition with equal rapidity after one treatment with staphylococci. More recently Page[12] tested the method with equal success. Catlin, Scott and Day[13] tried the staphylococcus spray on carriers in connection with an epidemic of diphtheria which occurred at the Rockford (Ill.) hospital. Of seventy persons, 17 per cent. developed diphtheria and 31 per cent. became carriers. In spite of liquid antiseptic treatment, some of them continued to remain carriers for a long time, but the bacilli soon disappeared after the use of the staphylococcus spray. Lorenz and Ravenel[14] also report good results in a few cases. Alden[15] of our laboratory reports good results in fifteen out of sixteen cases. The material used was a broth-culture of the *Staphylococcus pyogenes aureus* which was originally obtained from a throat culture submitted for examination for diphtheria bacilli. The inoculated broth tube was kept in the incubator at 37 C. (98.6 F.) for eighteen hours. The treatment consisted of sprays of the living staphylococci into the nose and throat. Treatments were given once a day until the patients were free from diphtheria bacilli.

Lydia Dewitt[16] in making an experimental investigation of this method of treatment was unable to determine to what influence the good effects are due. There is apparently no antagonism between the two organisms.

Aside from the occurrence of slight negligible reactions, the literature contains no reported cases of harmful effects produced by the use of the staphylococcus spray. I desire to report one case of this kind, which occurred in the practice of Dr. J. E. Luckey of Vinton, Iowa, with a culture supplied by us. He reports:

> We used the culture of staphylococci in two cases. Our first case responded beautifully, the bacilli disappearing in a few days. The second case cleared readily of the Klebs-Loeffler bacilli, but the reaction, consisting of local inflamma-

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[7] Petruschky: Arb. a. d. path., Inst. z. Tübingen, 1908, vi, Part 2, p. 331.

[8] Hall and Williamson: Jour. Path. and Bacteriol., 1911, xv, 350.

[9] Forbes, Duncan and Newsholme: Lancet, London, 1912, i, 292.

[10] Hewlett and Nankivell: Treatment of Diphtheria Infection by Means of Diphtheria Endotoxin, Lancet, London, July 20, ii, No. 4638.

[11] Schiötz: Uskadeliggereke af Infektionsbaere ved Difteri, Ugesk. f. Laeger, Copenhagen, Dec. 16, 1909, No. 50; abstr., The Journal A. M. A., Jan. 29, 1910, p. 422.

[12] Page, H.: Diphtheria Bacillus Carriers, Arch. Int. Med., January, 1911, p. 16.

[13] Catlin, Scott and Day: Successful Use of the Staphylococcus Spray on Diphtheria Carriers, The Journal A. M. A., Oct. 28, 1911, p. 1452.

[14] Lorenz, W. F., and Ravenel, M. P.: The Treatment of Diphtheria Carriers by Overriding with Staphylococcus Aureus, The Journal A. M. A., Aug. 31, 1912, p. 690.

[15] Alden, A. M.: The Staphylococcus-Spray Treatment of Diphtheria Carriers, The Journal A. M. A., June 14, 1913, p. 1876.

[16] Dewitt, Lydia: Action of Staphylococcus Aureus on the Klebs-Loeffler Bacillus, Jour. Infect. Dis., January, 1912, abstr., The Journal A. M. A., Feb. 3, 1912, p. 369.

tion with nausea, chills, high fever and rapid pulse, was so great that we desire to be excused from its use in the future.

The development of this severe condition may, of course, be a coincidence.

10. *Extirpation of the Tonsils when Markedly Enlarged and Removal of Adenoids.*—These conditions alone are indications for the operative procedures mentioned. The continuance of the diphtheria-carrier condition represents a further indication. On account of the wound produced, it is advisable to give an immunizing dose of diphtheria antitoxin before the operation, as cases of severe diphtheria in carriers following such operations have been reported.

AUTHOR'S EXPERIENCE AND EXPERIMENTS AS TO THE PRESENCE OF THE DIPHTHERIA BACILLI OF CARRIERS IN THE CRYPTS OF THE TONSILS

Discovery of the Crypts of the Tonsils as the Hiding Place of Diphtheria Bacilli.—During the spring of 1911 a number of cases of diphtheria occurred among the nurses and patients of the University Hospital at Iowa City. As it was suspected that some of the nurses or other employees of the hospital were diphtheria carriers an examination was made of the nose and throat of every employee in the hospital with the result that twenty-two of them (20. per cent. of the entire number) proved to be carriers. These were placed in isolation, the nose treated with an alkaline antiseptic spray and the throat gargled with a 1 per cent. solution of hydrogen peroxid. The desire for the inmates to be released from isolation as soon as possible caused eight of them to use a hydrogen peroxid gargle *within fifteen minutes* of the time that the culture was to be taken. The person who took the culture was apprised of this fact and consequently took two swabbings from each throat, one from the surface of the tonsils and pharynx and one from the crypts of the tonsils. In all but three of these cases, cultures from the surface swabbing did not contain any diphtheria bacilli, whereas, in every instance but one, cultures from the tonsillar crypts were positive. This indicated that so far as the throat is concerned, the crypts of the tonsils are the hiding-places for diphtheria bacilli.

Other Evidence Implicating the Tonsillar Crypts in Connection with the Carrier Condition.—Aside from the observation just noted, which I have noticed on a number of occasions subsequently, I may mention that:

1. The tonsils seem to be the logical place in which diphtheria bacilli should remain, in view of the fact that they are the parts most often primarily affected by diphtheria.

2. The surface being smooth and having mucus, saliva, etc., passing over it more or less constantly does not seem to be a favorable place for diphtheria bacilli to remain and multiply unless, of course, a membrane has formed. On the other hand, diphtheria bacilli or any other bacteria that have once gained entrance to the larger crypts, some of which are more than a centimeter in depth, find it a place in which they are but little disturbed, lined as these crypts are by squamous epithelium and not giving origin to any secretion or excretion to sweep the contained bacteria out, as occurs in connection with the ducts of glands.

3. Those who have had extensive experience with diphtheria-bacilli carriers report that a large proportion of them (considerably larger than among those who are not carriers) have enlarged tonsils with prominent crypt openings and deep crypts.

4. By squeezing the tonsils and forcing "plugs" of material out of the crypts, Kretschmer[17] has succeeded in freeing thirteen patients from the carrier condition on whom the more simple measures failed.

5. Treatment aimed at destroying the bacteria in the tonsillar crypts has proved successful in ridding diphtheria carriers of the contained bacteria. Although silver nitrate has long been used to treat inflammatory conditions of the throat, its use for treating diphtheria carriers whether there was naked-eye evidence of tonsillitis or not was first used, so far as I know, by Dr. L. W. Dean of Iowa City. He tried it first on the University Hospital employees in 1911. The carriers in question had been treated from three to ten days with antiseptic sprays and gargles, during which time only two of twenty-two carriers became negative. Of the remainder, fourteen had the crypts of their tonsils treated with silver nitrate. Of the cultures taken twenty-four hours later ten were negative. The remaining four became negative within three days. A number of physicians to whom I have recommended this treatment, have informed me that this method has yielded better results than any other method tried including the staphylococcic culture method (Luckey).

Method of Applying the Silver Nitrate.—A 5 or 10 per cent. solution is used and should be made up with distilled water and kept in a dark-colored bottle or a dark place to prevent deterioration. This solution is applied by means of applicators made of a metal which may be bent readily as copper and are long enough (about 11 inches) to admit of convenient handling. The end which is to be inserted into the crypts must be small (about 0.75 mm. in diameter) and roughened in order to hold cotton. Around this end is tightly wrapped a very small amount of cotton—only a few fibers, so that the cotton-wrapped applicator measures less than a millimeter in diameter. This is bent about a centimeter from the end so that the angle formed is a little more than 90 degrees. It is then dipped in the silver nitrate solution. All excess of the solution should, however, be removed by pressing the cotton against the inner side of the neck of the bottle. This is important since the excess may trickle down the throat to the glottis of the larynx where the reaction induced may prove serious. With the tongue well pressed down, the crypts should be probed preferably from below upward, since the slight amount of silver nitrate which may not enter the crypt tends to flow down and the whitening produced tends to obscure the openings of crypts below. The openings of the larger and therefore most important crypts are easily found and entered. To find the smaller ones it is often necessary to run the end of the applicator gently over the surface of the tonsil until it finds a depression. Several of the smaller ones may be probed without redipping the applicator into the nitrate solution. For the larger ones it is best to redip each time. If the cotton-wound probe is too thick, it will not readily enter the crypts. In that case the applicator without the cotton will often pass in easily. Without the cotton, however, it is impossible to introduce sufficient of the nitrate solution, unless possibly the applicator is sufficiently roughened just back of the tip to "hold" a little fluid.

The Effect of Silver Nitrate Applications.—Bacteriologic: The 5 per cent. solution of silver nitrate will destroy all bacteria with which it comes in contact. I have been unable to obtain a culture from many crypts that were thoroughly treated with silver nitrate from which I had just previously obtained cultures of the diphtheria bacillus and other organisms. This, then, is one way in which this treatment of the crypts gets rid of diphtheria bacilli.

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[17] Kretschmer, M.: Zur Bekämpfung der Bacillenpersistenz bei Diphtheriere-konvaleszenten, Med. Klin. 1911, vii, No. 3.

Pathologic: The silver nitrate solution (from 10 to 40 per cent.), if thoroughly applied, will destroy the lining epithelium of the crypts. If not thoroughly applied, the deeper epithelial cells are not destroyed. In any case there is an inflammatory reaction, the degree depending on the strength and amount of the solution. I have tried solutions up to 40 per cent. Although the stronger solutions produce more destruction of tissue and are therefore better, if that is what is desired, yet the reaction induced is often too severe. I believe, therefore, that the weaker solutions (from 5 to 10 per cent.) are the better. Microscopically the reaction consists principally of a hyperemia, a leukocytic exudation and a proliferation of fibroblasts.

The pathologic changes induced are probably of benefit in two ways:

1. The destruction of the epithelium of the crypts and the accompanying fibroblastic proliferation tends, no doubt, to obliterate the lumen of the crypt, which is quite obviously desirable.
2. The greater number and activity of the leukocytes renders greater phagocytosis possible, and the hyperemia brings to the area the antitoxic, bacteriolytic and opsonic properties of the blood. It is quite probable that the good effect of staphylococcic cultures is due to the induction of a similar reaction.

Clinical: My experience has assured me that the application of a solution of silver nitrate to the crypts of the tonsils is efficacious in ridding diphtheria carriers of the specific micro-organism. I believe that its use is more efficacious and less dangerous than the use of the staphylococcic culture; in other words, I believe it to be the best single remedy which we have.

CONCLUSIONS

1. The length of time during which patients who have had diptheria continue to carry diphetheria bacilli in the nose and throat after all clinical evidence of the disease has disappeared, and the frequency with which diphtheria carriers are found among persons who have never had the disease, renders it important in the interest of both the individual and the public health to rid carriers of the specific organisms as quickly as possible.
2. It is obvious from the large number of methods proposed for the removal of diphtheria bacilli from diphtheria carriers that no one method has proved satisfactory.
3. The use of the various antiseptics, gargled or sprayed, is of doubtful value in relieving the carrier condition, although they no doubt destroy many of the germs with which they come in contact and therefore lessen the infectivity of the carrier.
4. During the past few years, good results have been obtained by myself and a number of other observers, by the use of a spray of a culture of staphylococci.
5. I have obtained my best results by the treatment of the crypts of the tonsils with a solution of silver nitrate (from 5 to 10 per cent.) applied by means of a thin flexible applicator, combined with a mild alkaline and antiseptic spray (such as Seiler's solution), for the nasal cavity, and a 1 per cent. solution of hydrogen peroxid as a mouth-wash and gargle.
6. There is great need of applying the different methods of treatment aiming at ridding diphtheria carriers of the specific micro-organisms in a well-controlled manner in a large series of cases.
7. If it is found that diphtheria bacilli are frequently found in the urine of convalescents, more attention should be given to the hygienic aspects connected with this condition.

I desire to acknowledge the courtesy of Dr. L. W. Dean of Iowa City in supplying me with tonsils treated with solutions of silver nitrate of different strength at varying lengths of time preceding their removal.

ABSTRACT OF DISCUSSION

Dr. L. L. Ten Broeck, Minneapolis: The application of antiseptics to tonsillar crypts is an advancement over methods previously employed; it is also an acknowledgment of its shortcomings, to-wit, the difficulty of controlling the entire infected area. Reports based on cultural control alone may be misleading, since the areas accessible to culture are necessarily limited to areas accessible to antiseptic application. It is the inacessible areas and crypts that justify such methods as those of Scholtz (staphylococcus) or Emmerich (pyocyanase). The use of facultative pathogens, especially on raw surfaces in acute stages, is open to criticism, for postdiphtheritic staphylococcus infiltrations are not unknown. Furthermore, the bactericidal action of an organism is not demonstrated by spraying it copiously on a diphtheritic field, even if culture on mediums supporting well the growth of the sprayed organism subsequently fails to develop colonies of *Bacillus diphtheriae*. To illustrate, Dr. Corbett, city bacteriologist, found nothing but streptococci in a postdiphtheritic otitis medium. Dilute phenol irrigations, however, inhibited this growth and permitted pure cultures of *B. diphtheriae*. Subsequent mixed inoculations gave streptococci only. Given a medium supporting the *B. diphtheriae*, and not its antagonist, grow the two together on mediums suitable to both and one has an absolute test of the bactericidal properties of the antagonist. For example, here is a broth culture (exhibiting the same) of *B. diphtheriae* to which on the second day were added a thallophytic fungus (genus *Saprolegnia*) and human blood (since the fungus grows only on human blood so far as ordinary culture mediums are concerned, not on Loeffler's mediums.) Subcultures the third day on Loeffler's, likewise the fourth day (that is, from the inoculation with *B. diphtheriae*) are negative as you see in these tubes. Clinical tests have been made on normal throats, in twenty-five cases of follicular tonsillitis and in fifty cases of membranous tonsillitis without complications traceable to the fungus and with disappearance of the diphtheria germ in about seventy-two hours in cases controlled bacteriologically. A few patients have made a clinical and bacteriologic recovery following inoculation with the fungus alone without other medication. This (exhibiting specimen) is a diphtheritic cast of a uvula removed without recurrence sixty-eight hours after diagnosis and inoculation with the fungus, cultures remaining positive for three days only. Four membranes have been removed from four diphtheritic patients and inoculated on normal throats about twelve hours after use of fungus on patients. A slight faucial congestion negative for diphtheria was all that was noted, the thallophyte apparently growing to the exclusion of other contagion. Perhaps it will be possible to compel the patient to transmit the prevention as well as the contagion even at this early stage. The dispensing is simple —a powder, kept in vials, consisting of spores lactose (a diluent) and blood on which it is grown and from which it is filtered. These statements are based on results that are at present undergoing critical review in the University of Minnesota. A report will be forthcoming as soon as they are substantiated.

Dr. Henry Albert, Iowa City, Iowa: Were cultures made after forty-eight hours following the use of the spores?

Dr. L. L. Ten Broeck, Minneapolis: Yes; cultures were made up to four days. The test has been repeated with a number of strains.

Dr. Harold B. Wood, Rochester, Minn.: Just because the diphtheria bacilli finally give way to staphylococci in the throat is no specific reason why only the staphylococci themselves should be used as overriders. After Ravenel put that theoretic transference into the practical experience of using the staphylococci as overriders to eliminate the diphtheria bacilli, all or practically all the experimenters seemed to be using the same organism. That organism is well known to be a facultative pathogen. Some other organism which cannot damage the human body would perhaps be the more ideal organism to use in overriding.

I have one report which is so brief that no conclusions can be drawn from it; however, it may be of interest. At Rochester we have recently (this year) been using the lactic acid bacillus as an overrider. Four cases of diphtheria appeared in the state insane hospital. The cases had absolutely no direct connection one with another; but it was found that they had an indirect connection with a certain kitchen. Cultures were made from all of the help of that kitchen and one woman, who had never had any symptoms of diphtheria, was found to be the carrier. Her throat was swabbed and sprayed with various antiseptics of different strengths, and repeatedly, for six weeks, gave positive cultures. Then, at the suggestion of Dr. A. H. Sanford, bacteriologist to the Mayo Clinic, the lactic acid bacillus spray was used. The lactic acid bacillus is harmless, undoubtedly, to human beings; it is easily obtained and is a rapid grower. This spray was used for several days and then, two weeks after that, the woman was examined for the first time and gave negative cultures. About three weeks ago our next cases of diphtheria appeared. Four patients were given antitoxin, their throats swabbed out with tincture of iodin, and no effect obtained in neutralizing the diphtheria growth. Three sprayings were given each person within thirty-six hours, and every subsequent culture was negative. One case was especially severe: A young man came from South Dakota with a well-advanced case of diphtheria. His entire pharynx was blocked with membrane, and within thirty-six hours he was given twenty-eight thousand units, with no effect except to check the increase of the membrane. His throat was swabbed with pure tincture of iodin a number of times without effect; but after being sprayed with the lactic acid bacillus three times within thirty-six hours the membrane showed rapid decrease, and within three days it had entirely disappeared. Before the spraying, all the cultures had been positive; after spraying all were negative. These results are simply suggestive, but are offered that the plan may be carried out by others who have greater opportunity for work. There is one practical point in this connection: If a country physician finds a case of diphtheria and if he is without antitoxin or antiseptics, it would do no harm, and might do good, to flush the nasal cavity and the throat thoroughly with ordinary sour milk.

Dr. D. L. Richardson, Providence, R. I.: We have tried all kinds of solutions in the treatment of diphtheria-carriers with about the usual results. We have used silver nitrate solution, staphylococcus spray, iodin, iodin and glycerin, peroxid of hydrogen and bichlorid of mercury as applications to the fauces, to the throat, to the nasopharynx and to the nose, and we have come to the conclusion that cases should be left alone for a certain period of time, no applications being used except some mild solutions when there is a marked nasal discharge. After a certain period, if the cultures continue to be positive, we generally make application of tincture of iodin or of iodin and glycerin. If this, however, proves of no value, we have for eighteen months removed adenoids and tonsils. This latter is, judging from our own experience, a most efficacious method of getting rid of diphtheria bacilli in persistent carriers. Once in a while, we will fail, but I think less frequently than with any other method of treatment. Remember that in getting rid of the foci of infection, the adenoid tissue and tonsils, we have removed the deep infection which local applications could not reach. Then, if overriding with staphylococcus spray is theoretically or practically of any value, by the operation you have infected the throat with the organisms resident in that throat. Whether it is this or the removal of the adenoids and tonsils that rids the throat of the different organisms, I am not sure. I do know that in England they are removing adenoids and tonsils for this purpose. After operation and until discharge, there is little danger of the throats picking up other organisms, whether diphtheritic or otherwise; but it is our custom to quarantine all such cases so long as the throat shows any active inflammatory result after the operation or until the patient is discharged.

Dr. C. Hampson Jones, Baltimore: In Baltimore we have tried to solve this question not only in the use of all kinds of antiseptics, but also in trying to determine whether or not it is necessary to use anything to clear up the throat.

Drs. W. L. Moss and Guthrie of the Johns Hopkins Hospital carried out a series of experiments during the past twelve or eighteen months. I know that from fifty positive throats that were followed day after day and week after week there were absolutely no cases of disease produced. . . . Exactly what it means we do not know. Of course, Dr. Moss and Dr. Guthrie and others have worked out the strictly scientific end of it, so far as the bacteriology is concerned, and no doubt their report will be found of great interest.

There is one method of clearing up the throat not mentioned to-day, that might be of service somewhere, that is, the use of iodin. The iodin we use is known as Boulton's solution of the national formulary—a combination of phenol (carbolic acid) and iodin—which clears up the throat wonderfully well; but the preliminary spraying of the throat with cocain and going over the throat with the finger, pressing out the crypts, not only of the tonsils but also of the pharynx, will make the subsequent application of Boulton's solution much more effective, because it seems then to get into the crypts.

Dr. M. P. Ravenel, Madison, Wis.: Dr. Jones has brought up an entirely new point of view. Several years ago I recommended that spongy and enlarged tonsils should be massaged. We use the true ivory spatula for this purpose; the finger would do just as well. In cases in which the spray did not act well, massage of the tonsil and use of the spray a second time cleared up the condition in practically every instance, without any trouble. Dr. Jones has brought out another point, namely, the non-contagiousness of the disease in some of these diphtheria-carriers; but what about the condition of the carriers themselves?

Dr. Lawrence and myself have used the staphylococci spray for treatment. It is an excellent method, except in carriers; but we are going to try it next winter early in the case, more exclusively with reference to the treatment of the disease.

Dr. E. F. Otis, Peñuelas, Porto Rico: We are on the right track when we do not treat these tonsils too vigorously with too strong an antiseptic solution. My practice has been to use a very strong alkaline sodium bicarbonate, combined in a normal saline solution, and thus cut away all mucus; and then I use healing oils that are not too strong. I find that this method does not seem to set up an irritating reaction.

Dr. Henry Albert, Iowa City, Iowa: The number of methods that have been discussed emphasizes one of the conclusions that we made; namely, that no one method has as yet proved satisfactory for the proper treatment of the carrier condition.

DISEASES OF PORTO RICO *

ELMER F. OTIS, M.S., M.D.
PEÑUELAS, PORTO RICO

Porto Rico is an interesting island-gem forming an emerald setting of the crescent of the West Indies. The climatic and social conditions are such that the various diseases have no difficulty in making great headway, when permitted to pursue their natural course. It is about the diseases here encountered that I wish to speak.

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* Read in the Section on Practice of Medicine of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

Manson has well said, “If by ‘tropical diseases’ be meant diseases peculiar to the tropics, then half a dozen pages might have sufficed for the description [for, at most, only two or three comparatively unimportant diseases strictly deserve that title]. If, on the other hand [the term] include all diseases occurring in the tropics, then the work would require to cover almost the entire range of medicine.”

TUBERCULOSIS, TYPHOID AND MALARIA

Tuberculosis, typhoid and malaria may justly receive first mention; while rickets, bronchopneumonia, angina pectoris, venereal diseases, tumors, meningitis and a variety of chronic rheumatic affections are not unfrequently found. On account of the fact that the warm climate favors germ growth, varied forms of enteritis take their full toll from among the young people that are born and reared amid tropical surroundings. The death-rate for this disease alone last year in Porto Rico was 41 per ten thousand.

Tuberculosis is a community disease of the thickly settled parts, and is proving to be a most difficult problem to handle in tropical lands. The *Liga Antituberculosis* is working along the general lines of its sister society in America; while the insular government remembers the distressing condition of her “white-plague” victims by periodic appropriations. On account of the rapidly increasing population of the island the number of deaths from tuberculosis per year is numerically on the increase. The death-rate had dropped, however, from 20 to 14 per ten thousand during the fiscal year 1911-1912.

The people of Porto Rico have until recently supposed that when the diagnosis of pulmonary tuberculosis was established, there was absolutely no hope for them. This idea, working in connection with the lack of climatic stimulation and the prevalence of some very unhygienic customs, makes the cure of the patient and the prevention of the spread of tuberculosis even more difficult than in our northern latitudes. The custom of tightly closing all doors and windows, and thereby excluding the night air which is considered so deleterious, brings with it a baneful effect. Very few indeed of the better houses have any provision for ventilation at night time. Those who live in the “shacks’ fare somewhat better from the fact that it is impossible to make these air-tight.

Typhoid fever is practically endemic and, on account of the fact that it is many times confused with paratyphoid and coli bacillosis, reliable statistics are not available. My experience has been that custom strongly opposes the idea that any infectious disease should be diagnosed as it actually exists, and that it should be given the benefit of every possible doubt. Preference is given to a diagnosis that carries with it no unpleasant forebodings.

The general manifestations of malaria seem to be about the same the world over. This, however, is a subject for special study for those of us who are situated in tropical zones. Laboratories are being establised whereby we may study its more uncommon manifestations. There is a virulence which goes with it in the warmer latitudes that is not even to be seen in the north. Those who especially study it think that they can see a possible connection between it and the kala-azar of the East Indies or even the black-water fever of Africa. Malignant malaria is exceedingly common, and the treatment must be heroic, else the patient goes into profound delirium or succumbs to intense toxemia.

TROPICAL ANEMIA

Tropical anemia (uncinariasis or what was first called “lazy-man’s sickness”) is the most interesting to us because of its influence on the health, happiness and prosperity of our people. It was on Porto Rican soil that its identity was first worked out by Ashford. It was here, also, that the enormity of its deleterious effect on human life and efficiency was demonstrated, another of the world’s great economic problems, and thereby solved. Its discovery came at a time when practically every one in Porto Rico was infected, and the hungry *jíbaros* were crying to heaven for relief from their physical disabilities. They were described by Fray Inigo Abad as “having the appearance and color of convalescents.” That was in 1788; and there is little doubt but that the like condition had prevailed since 1530. It was the Medical Corps of the American Army, whose men are ever ready to lay down, if necessary, even life itself, which finally came to the rescue of the Porto Ricans.

The accompanying table gives a few of the results obtained from a special examination of the schoolchildren in our municipality and will be of interest. All classes of children are here represented, and Peñuelas is so situated that almost all physical and climatic conditions are found. Its territory stretches from the coastline to the tops of the mountains. The twelve *barrios* represent almost all industries and social conditions and are therefore typical of the island in general. In spite of the large amount of anemia work that had been done in the place, there was still to be found an average of 38 per cent. of the schoolchildren infected with uncinariasis. Eggs of other parasites, such as *Ascaris, Trichocephalus* and more rare varieties, were found in 72.4 per cent. of the feces examined for the hookworms. I observed that an evident pallor was to be detected in 53.3 per cent.; while the average hemoglobin was 81.5 per cent.

SUNDRY DISEASES

Asthma is frequently found.

Whooping-cough is endemic.

Nervous affections limit themselves to a few—largely on account of the simple life of the majority of the inhabitants; but most of the native women are afflicted with a peculiar form of hysteria in which they must be restrained lest they do themselves bodily injury. It is called *ataque,* and sometimes assumes almost an epileptoid nature.

Among eye affections cataracts are frequently found—especially in those suffering from an intense degree of hookworm infection. A persistent form of conjunctivitis is endemic; however, my expreience has been that it responds readily to medication, when the ordinary hygienic measures are adopted.

Trachoma has never been reported, except in a very few cases in which the infection was caught while sojourning in some other country.

Obstruction of the bowels is commonly encountered. The people in general do not attend to their bowels. Not infrequently the country people report having gone from three to six days without a movement, sometimes twenty days or more have passed. On closer inquiry, however, they usually recollect having had “very slight movements once or twice.” These abnormally long periods are accounted for by them from the fact that often the patient has eaten very little or nothing during his entire illness.

Idiopathic tetanus is quite often reported.

Eruptive fevers, except possibly scarlet fever, are found in Porto Rico, but are usually of a mild character.

Filariasis (elephantiasis), like malaria, seems to confine itself mostly to certain sections of Porto Rico. No satisfactory explanation for this is offered.

The lepers are segregated in a colony on Goat Island within the San Juan harbor. They usually number about forty.

Sprue is more common than was previously supposed, and is being studied by a special committee of the insular medical society. Dr. Bailey K. Ashford's report will appear in due time.

I have not yet encountered in Porto Rico a case of pellagra or dengue. The vital records show none. The former probably exists there.

Beriberi and yaws have been reported, but I have not as yet heard of the diagnosis being confirmed.

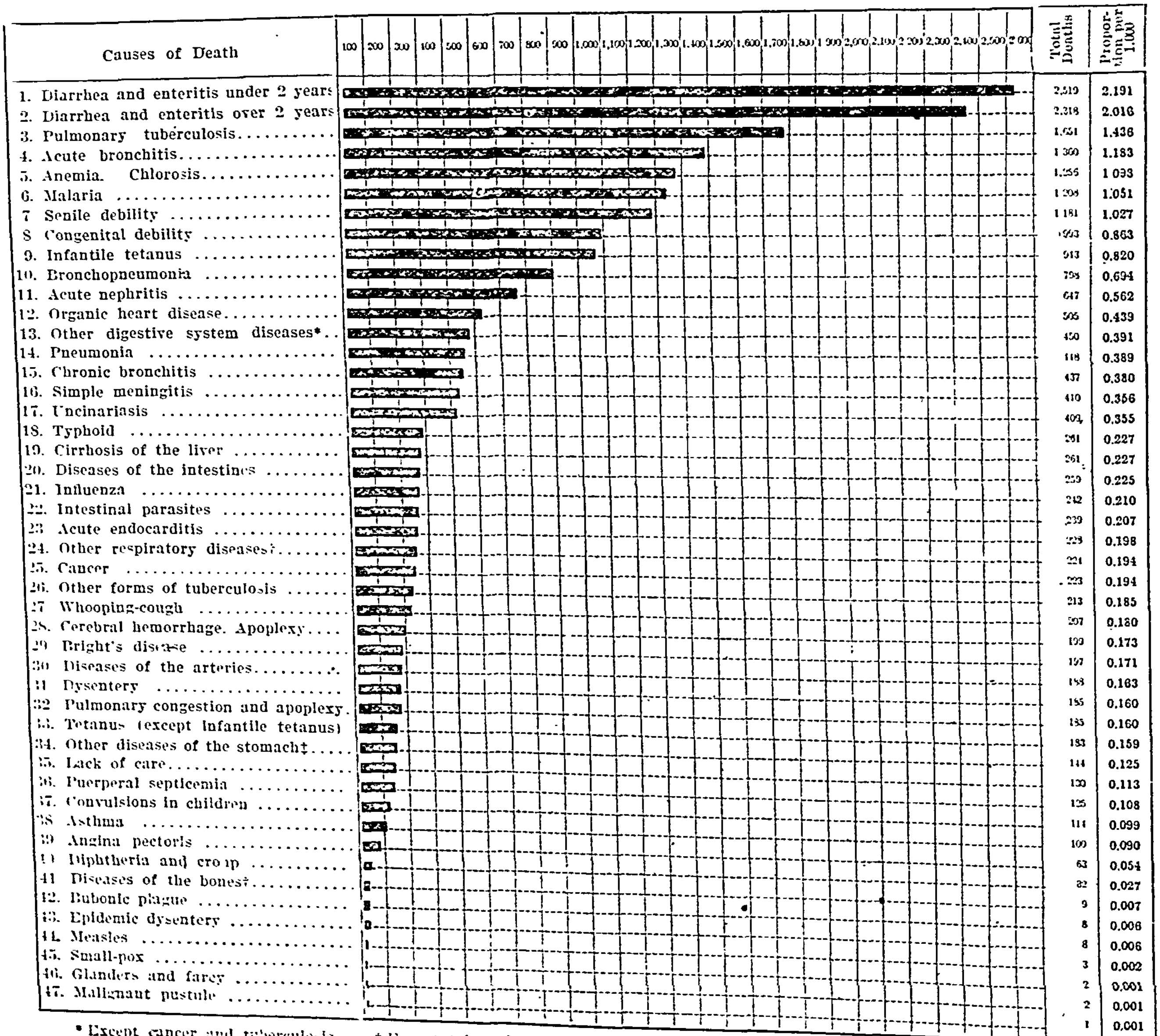
EPIDEMICS

Porto Rico has shared in periodic epidemics with her sister islands for centuries.

Yellow fever is supposed to have originated in the West Indies. No date is given, but it was first reported from Guadaloupe in 1635. Soon afterward it occurred in Barbados, Cuba, Jamaica, Santo Domingo, Martinique and in St. Thomas—forty miles off of our east coast—in 1793. I can find no record of its having become epidemic in Porto Rico, although it is known that occasional cases have been seen there. It is mentioned as having been present in 1783; however it is difficult to obtain accurate data from the Spanish colonial records. Yellow fever is now believed to be a thing of the past in Porto Rico. It has never appeared on the island since the American occupation. During the past year a special campaign has been waged against all kinds of mosquitoes.

Cholera once visited Porto Rico, in 1845, and the experiences are still vivid in the memories of a few of the survivors. The invasion lasted over four months; slaves were decimated by the scourge; it also entered the homes of both rich and poor; the people died "almost in their tracks" and were carted off toward the trenches on the lonely hillsides—sometimes before they were quite dead. One dying woman in a comatose state, who was supposed to have died just as the last rounds for the

CHART OF MORTALITY



Causes of Death	Total Deaths	Proportion per 1,000
1. Diarrhea and enteritis under 2 years	2,519	2.191
2. Diarrhea and enteritis over 2 years	2,318	2.016
3. Pulmonary tuberculosis	1,651	1.436
4. Acute bronchitis	1 360	1.183
5. Anemia. Chlorosis	1,256	1 093
6. Malaria	1 208	1.051
7 Senile debility	1 181	1.027
8 Congenital debility	993	0.863
9. Infantile tetanus	943	0.820
10. Bronchopneumonia	798	0.694
11. Acute nephritis	647	0.562
12. Organic heart disease	505	0.439
13. Other digestive system diseases*	450	0.391
14. Pneumonia	448	0.389
15. Chronic bronchitis	437	0.380
16. Simple meningitis	410	0.356
17. Uncinariasis	409	0.355
18. Typhoid	261	0.227
19. Cirrhosis of the liver	261	0.227
20. Diseases of the intestines	259	0.225
21. Influenza	242	0.210
22. Intestinal parasites	239	0.207
23 Acute endocarditis	228	0.198
24. Other respiratory diseases†	224	0.194
25. Cancer	223	0.194
26. Other forms of tuberculosis	213	0.185
27 Whooping-cough	207	0.180
28. Cerebral hemorrhage. Apoplexy	199	0.173
29 Bright's disease	197	0.171
30 Diseases of the arteries	188	0.163
31 Dysentery	185	0.160
32 Pulmonary congestion and apoplexy	185	0.160
33. Tetanus (except infantile tetanus)	183	0.159
34. Other diseases of the stomach‡	144	0.125
35. Lack of care	130	0.113
36. Puerperal septicemia	125	0.108
37. Convulsions in children	114	0.099
38 Asthma	100	0.090
39 Angina pectoris	63	0.054
40 Diphtheria and croup	32	0.027
41 Diseases of the bones†	9	0.007
42. Bubonic plague	8	0.006
43. Epidemic dysentery	8	0.006
44. Measles	3	0.002
45. Small-pox	2	0.001
46. Glanders and farcy	2	0.001
47. Malignant pustule	1	0.001

* Except cancer and tuberculosis. † Except tuberculosis. ‡ Except cancer.

night were being made, was being transported by a policeman and peon. The fresh air seems to have revived her till she came to herself and desired an explanation as to what was happening. Thereupon, her superstitious "pall-bearers" dropped their charge and fled. She managed to crawl on her hands and knees to a nearby brook and proceeded to alleviate her burning thirst. She shortly recovered.

Another, a boy living in the rear of his father's provision store, was left to his fate while the family were occupied with the "watch" over his dead brothers. He reasoned thus: Although it is considered very dangerous for a cholera patient to take either food or drink, yet it is better to die in comfort with a full stomach than in the miseries of a forced starvation. He improved the opportunity to steal into the store and consume an incredible amount of both bread and water. He had only sufficient strength to crawl from his cot to the store-room, but he was soon up and about and began to insist that his fellow sufferers should also try these measures. Almost all who tried this method survived. The lad is now an old man and takes great pleasure in relating these and many similar experiences which he had when the druggists were the doctors, and customs ruled supreme.

The treatment in vogue at that time was starvation, and deprivation of water and air. A poultice made from a native cactus was applied hot to the abdomen. For this was sometimes substituted the *balleta*, made by sewing together many thicknesses of blanketing and applied as a protection to the trunk.

Small-pox and typhoid have made their periodic visitations—have been at times almost endemic. Thanks to vaccination and the recent introduction of antityphoid injections, these diseases are now found in inverse proportion to the preventive efforts put forth. In the case of typhoid, the campaign against flies and the use of calcium hypochlorite in the drinking-waters has greatly assisted in the results. There are still to be found among the adults many who are pock-marked—an object lesson as to existing conditions in former days. The radical treatment of threatened typhoid epidemics of the last year by the free vaccination of the people gave brilliant results; and I have yet to find a single case in which a person developed the fever after having had the three injections.

Plague was discovered in the Port of San Juan, June 18, 1912, and was immediately recognized. The management and control of the situation by the sanitary department, seconded by the United States War Department, is another brilliant object lesson to the world as to what may be accomplished by concerted effort. There was a total of fifty-five cases with thirty-six deaths. The situation was controlled mainly by the vigorous campaign against rats; and also the use of the antiseptic injections. The last case developed on September 8.

It was demonstrated that the public control of an epidemic need not seriously influence commerce, but serves rather as a safeguard to business by instilling confidence into the minds of the citizens.

Dangers of Short-Circuiting in the Feeding of Infants.—In my private practice I meet wasting infants, who immediately after birth have been submitted to the tender mercies of a wet-nurse in full lactation. If a healthy infant cannot be expected to short-circuit the colostrum period, how much more improbable is it that a delicate and degenerate infant, on whose life, perhaps, much depends, will be able to dispense with simple lessons in digestion and learn to run before it can walk.—Eric Pritchard, in (London) *Clinical Journal.*

THE EFFECTS OF COLLOIDAL COPPER WITH AN ANALYSIS OF THE THERAPEUTIC CRITERIA IN HUMAN CANCER *

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NEW YORK

During the past six months, the activities of the research staff of the General Memorial Hospital, devoted under the auspices of the Cornell Medical College to the investigation of malignant disease in human beings, have been in part directed to an analysis of the effects of metals in colloidal solution. In the present communication, the results obtained from a study of colloidal copper will be briefly described. This part of the work is now at an end, and it seems advisable, in view of the very considerable interest in the effects of copper in cases of malignant disease, to contribute to the general discussion of the subject the clinical records which have been collected, and such additional data in this connection as seem to be fairly well established. These records and data have been contributed in part by the clinical service of the hospital, in part by the laboratory departments both of the university and of the hospital, which have severally cooperated in the investigation of this subject. The clinical observations have been made by Drs. Brown, Michailovsky and myself; the chemical data have been contributed by Drs. Benedict and Lewis; the pathologic examinations were made by Dr. Ewing; the photographic and roentgenographic services have been under the direction of Drs. Cole and Holding.

Interest in the therapeutic effects of colloidal solutions of the metals has been very active for about fifteen years. This interest has been largely confined to the effects of these substances in the infectious diseases, owing to the fact that collargol, in particular, has been highly recommended and widely employed in gonorrheal ophthalmia and in general sepsis. During the course of the past year (1912), however, attention was drawn in Germany and France to the fact that the experimental tumors of animals are very strikingly influenced, and in some cases cured, by the intravenous injections of colloidal solutions of the heavy metals and of their compounds. In December, 1912, Leo Loeb[1] and his co-workers published a preliminary article on the effects of colloidal copper in human cancer, containing a detailed report on eight cases. In summarizing their results they state that they "are now able to cause the gradual retrogression of human cancer which until now has withstood various modes of treatment; and, furthermore, that the treatment does not seem to be limited to one kind of cancer, but applicable in the effective treatment of various kinds of cancer." In detail, they observed relief from pain, improvement in the function of diseased areas, general constitutional improvement and gain in weight. The tumors decreased in size, induration lessened or disappeared, granulations sprang up and cicatrization or epidermization played their normal rôle in obliterating or covering the defects produced by the disease. The authors point out, however, that "patients, in whom the growth of metastases is very rapid and extensive, and in whom the cachexia is already very pronounced, cannot yet be benefited by this mode of treatment." In two subsequent papers, of which the latest appeared in May,

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* From the Cancer Research Service of the Cornell University Medical School in the General Memorial Hospital, and the Huntington Fund for Cancer Research.

[1] Loeb, Leo; McClurg, C. B., and Sweek, W. O.: The Treatment of Human Cancer with Intravenous Injections of Colloidal Copper, Interstate Med. Jour., 1912, xix, 1015.

1913, Loeb[2] confirms his previous report, and adds further records of cases in which colloidal copper has caused a more or less marked diminution in the size of various malignant tumors, citing cases of medullary sarcoma of the humerus, of infiltrating carcinoma of the mouth and cheeks, of multiple carcinoma of the face and neck, of carcinoma of the thyroid, etc.

PREPARATION AND ADMINISTRATION OF COLLOIDAL COPPER

Shortly after the appearance of his first publication, Dr. Loeb was kind enough to give us complete details as to the preparation of the copper solution and as to its mode of administration. Since that time, we have used the method in the treatment of twelve ward patients in the Research Service of the General Memorial Hospital.

In the preparation of the copper, we have followed the method originally employed by Loeb, who states that he followed the method of Bredig.[3] In the solutions prepared in our laboratory the copper was found to be present in amounts averaging 30 mg. per liter (quart). Whether this copper is present as a metal, as an oxid or as a hydroxid has not yet been determined, but one of the latter seems the more likely. When freshly prepared, the solutions give the enzyme reaction with hydrogen peroxid, but only slightly or not at all with benzidin. Within twenty-four hours or less, however, this reaction is markedly diminished or lost. In order to avoid this as well as other secondary changes, we have made a practice of using only fresh solutions.

In the administration of the solution we have followed Loeb's plan, employing exclusively the intravenous route and making injections, so far as possible, on every day of the period of treatment. In this connection arose a problem of theoretical interest and also of some practical importance concerning the behavior of the colloidal solution when in contact with the blood. It has long been known that certain colloidal solutions have a tendency to precipitate each other. When such precipitation occurs, the colloidal state is, of course, altered, and the special properties which characterize substances when in that state are thereby destroyed. In order to determine whether or not such precipitation was likely to occur in the blood-stream on the introduction of colloidal copper, we made a series of test-tube determinations, in which blood-serum and colloidal copper were mixed in varying proportions. The results of these determinations will not here be given in detail. The accompanying table, however, is included in order to illustrate the fact that, in certain proportions, mixtures of human blood-serum and of colloidal copper solutions do produce flocculation. This flocculation is due chiefly, if not entirely, to the copper, and not to the serum. The table confirms the law, deduced by Buxton and his co-workers in Cornell, that colloidal solutions of the heavy metals, when mixed with other colloids in a series of dilutions, present a prozone, in which no flocculation occurs, a midzone of flocculation, and a postzone, in which, again, flocculation is absent.

The table shows the results of mixing equal parts of blood-serum, and of a solution of "colloidal copper," the former diluted with normal salt solution, the latter diluted with distilled water, in the proportions indicated. Controls of copper with salt solution, and of serum with distilled water, in the same proportions as those used in this table, failed to show flocculation.

The table is designed to cover all such combinations of colloidal copper and of blood as might probably result from the intravenous injection of the former. The copper solution might conceivably be introduced in a stream of less volume than that of the blood circulating in the vein, or the reverse of this condition might obtain. The table demonstrates that only in case the blood-serum *is* approximately *one-sixtieth*, or less than that, of the copper solution in volume does flocculation occur. Under the conditions which governed the injections as made by us, it is safe to assume that the blood-stream always dilutes the copper solution in a relatively greater volume than this; the factor of flocculation may therefore be excluded.

VARIOUS DILUTIONS OF RESULTS OF MIXING EQUAL PARTS OF BLOOD-SERUM WITH SOLUTIONS OF COLLOIDAL COPPER

SERUM DILUTIONS

Copper	1:15	1:20	1:25	1:30	1:35	1:40	1:45	1:100	1:500	1:1,000
Undiluted...	—	†	†	†	++	++	++	++	+	+
½	—	†	†	+	+	++	++	++	+	—
¼	—	†	†	+	+	++	++	++	+	—
⅛	—	—	—	—	—	—	—	†	†	—
1/16	—	—	—	—	—	—	—	—	—	—

. The signs used have the *following significations*: +, *immediate* moderate flocculation; ++, immediate pronounced flocculation; †, flocculation after incubation; —, no flocculation.

The fact that the administration of copper in this form has a very marked tendency to produce phlebitis and periphlebitis, and that this tendency becomes accentuated with repeated injections, renders it advisable constantly to vary the site of injection. In a long-continued course of treatment, it becomes necessary to call into requisition all available superficial veins of both upper and lower extremities. On this account obese persons are most unfavorable subjects for treatment and must, in many instances, be considered entirely unsuitable. With the exercise of the utmost precaution, it is frequently impossible to avoid the occurrence of some degree of phlebitis. This may not amount to much more than a slight induration of the veins with some pain. On the other hand, there may be an extreme grade of induration, with thrombosis, severe pain, tense edema, superficial discoloration along the path of the veins and all the concomitants of an intense phlebitis and thrombophlebitis. These lesions, however threatening clinically, have not in any of our cases been associated with more than a very low grade of pyrexia or general malaise. The inference is permissible that they are not septic or infectious in character, but represent merely the result of a chemical irritation of the endothelium. This conclusion is borne out by the inflammatory reaction which almost regularly accompanies the loss of small amounts of the copper solution into the subcutaneous tissue. As might be expected, under this assumption, the local symptoms rapidly subside when treatment is withheld. In no case have we witnessed any clinical indication of embolism, or infarct formation. In some persons the phlebitis has resulted regularly in the obliteration of the affected veins, so that eventually none was left accessible to injection. As a consequence of the impairment to the return circulation, there may be, as in one of our cases, a more or less prolonged condition of low-grade subcutaneous edema.

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[2] Loeb, Leo: Summary of Investigations in Tumor Growth Carried out in the Research Department of the Barnard (Free) Skin and Cancer Hospital, St. Louis, Interstate Med. Jour., 1913, xx, p. 298.

[3] Bredig: (Anorganische Fermente, Leipsic, 1901, p. 34) asserts that colloidal copper is one of the metals which cannot be prepared by this method.

The factors which determine the production of this symptom are somewhat elusive. In a series of patients who daily received injections of identically the same solutions, some responded quite characteristically with inflammatory reactions, whereas others did not. Personal idiosyncrasy apparently plays a preponderating rôle in the result. Whether this idiosyncrasy is dependent on certain features of the blood, or of the veins, has not been determined.

GENERAL EFFECTS OF THE INJECTIONS

The constitutional effects of the injections, aside from their effects on the tumors, are of importance. Loeb drew attention to the fact that the earlier injections are followed invariably by a rise of temperature and frequently by a chill. He states that these manifestations decrease in severity with subsequent injections. "The general condition (appetite, strength, complexion) improves." Our own experience does not entirely coincide with these statements. They hold true indeed, of some of our patients. On the other hand, certain of the patients bore very large daily injections—up to 700 c.c. —without any rise of temperature during the earlier period of the treatment, whereas they subsequently reacted violently. In still others, throughout the treatment chills and pyrexia were a constant accompaniment of the injections. These symptoms are not in themselves of serious import, in spite of the fact that they somewhat impair the general health and comfort of the patient. A more disquieting symptom is the nausea, sometimes associated with vomiting, which occasionally occurs and which may materially interfere with the proper nutrition of the patient.

In spite of these undesirable features of the treatment, however, the majority of the patients stand it fairly well over a period of about one month. We have not, indeed, observed that the "general condition improves." On the contrary, our cases have almost without exception shown a slight, though steady, loss of weight, as a rule not exceeding from 5 to 10 pounds. Hemoglobin determinations have shown, as a rule, a steady deterioration of the blood, ranging from 10 to 20 per cent. of the original hemoglobin estimation previous to the use of the injections. These undesirable, though by no means serious, sequelae, seem to us to be attributable to the effects of the copper rather than to the natural progress of the disease and its associated cachexia. Many of our patients have improved perceptibly on the cessation of treatment.

The rather striking pallor of many of these patients cannot be explained on the basis of an increased anemia. It is entirely in excess of the calculable loss of hemoglobin. In view of the generally accepted belief that the colloidal metals injure the wall of the capillaries, a belief which is based on the observed effects in animals, it may possibly be due to a spasm of the superficial vessels. At all events, it is well to realize that the pallor in these cases is no index of their anemia.

A rather striking symptom is the hemoglobinuria which occasionally accompanies an injection. In some patients this is a very exceptional symptom, while in others it has occurred with greater frequency. It is in itself of no great moment, inasmuch as the corresponding degree of destruction of the red blood-cells cannot be great. The hemoglobinuria is never more than slight. In one case, in which it occurred with some frequency, we tried to determine whether the destruction of the red cells was due to the copper or to the distilled water. The injection of distilled water alone, however, on the few occasions on which it was tried, failed to produce the symptom. We are of the opinion, therefore, that the copper exercises some toxic influence on the red blood-cells.

The same toxic effect manifests itself on the kidneys. It is the rule, and not the exception, that the cases under treatment show small amounts of albumin in the urine. If albumin had previously been present, it is likely to be increased in amount. This symptom is in itself of no great clinical importance. The patients give none of the evidences of renal insufficiency, unless occasional headaches be reckoned in this category. It is of importance, however, in conjunction with the hemoglobinuria, as indicating that the copper is not without a destructive effect on the normal tissues and organs of the body.

This impression receives some confirmation from the examination of the organs removed at necropsy from a patient who had been under treatment. The following details have been excerpted from the pathologic report:

> The liver shows capillary congestion. The liver cells show slight granular and fatty degeneration. Their nuclei are greatly increased in number and vary in size, presenting many giant nuclei. The peripheries of the lobules contain a heavy deposit of coarse granular pigment. The right kidney is in a condition of advanced atrophy with interstitial fibrosis. The left is the seat of an intense acute degeneration of tubule cells, many of which are necrotic. The glomeruli show moderate old fibrosis. The tumor is well nourished and actively growing.

In the absence of other etiologic factors, it seems justifiable to attribute these lesions to the action of the copper, especially, in view of the fact that the clinical observations previously described lend definite support to this interpretation.

As regards the excretion of the copper, our analyses show that little, if any, leaves the body in the urine. On the other hand, large amounts are found in the feces. In the absence of a prolonged series of quantitative determinations, it cannot be said that the total amount of the copper introduced by the veins leaves the body by way of the intestines, but it is certain that the major portion can be recovered in the feces.

The distribution of the copper in the body, assuming that a part of it is stored up for a time, is a matter of great interest. As bearing on the problem, we have data derived from one operation and from one necropsy. The case which came to operation was one of sarcoma of the jaw. The patient had been given almost daily injections of the copper solution for a month, during which period he had received, in all, 11½ liters. The injections had been discontinued a few days before the operation. A mass of tumor tissue weighing a little over 60 gm. was examined chemically for copper. Not the slightest reaction, however, could be determined. In view of the fact that the method of analysis employed was found reliable in the recovery of very small amounts[4] of copper when mechanically mixed with organ dèbris, and that, in another case, considerable amounts were obtained from the liver, it is safe to assume that the tumor tissue in this case contained practically no copper.

The necropsy was obtained on a case of embryonal sarcoma, originating in the testicle, and metastasizing to the abdominal lymph-nodes. The patient had received about 3 liters of the copper preparation, and was under treatment until the time of his death. Of the tissues removed at necropsy, the liver, kidney and tumor were submitted to chemical analysis for copper. In a 30-gram and in a 60-gram portion of tumor tissue no trace of copper could be found. The kidney, likewise, was entirely free. In a 90-gram portion of the liver 1.8 mg. of copper were determined, giving a ratio of 20 mg. of copper per kilogram of liver substance. It has long been known that the heavy metals when introduced in considerable quantities into the body, whether by way of the stomach or by any other method, tend to become deposited in the liver. To this rule the intravenous injection of metals in the colloidal state seems to form no exception. In an article published during the current year, Duhamel[5] has shown that when rabbits receive a solution of colloidal iron intravenously, approximately 90 per cent. of the total iron recoverable from the body is found in the liver. In this respect, therefore, the findings in our case are entirely in harmony with those hitherto reported.

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[4] When 5 mg. of copper, as copper sulphate, were mixed with 60 mg. of tissue, all except a small fraction was recovered.

The absence of copper from the tumors in both of these cases is an observation of some importance. If there were a special affinity between the tumor tissue and the copper—and such an affinity must in all probability be posited if the copper does indeed exercise a specific toxic effect on the tumor—it would be reasonable to expect the presence of copper in some amount in the tumor tissue. Its absence is a priori, a material obstacle to the assumption of any such affinity. There is, indeed, an alternative possibility. It has been suggested that the effects of the colloidal metals in the experimental tumors of animals may be secondary to circulatory disturbances produced by the toxic action of these substances on the endothelia of the capillary muscles. This interpretation is supported by the striking and immediate vascular alterations in such tumors, following the injections. In the case of human tumors, no such vascular concomitants have been observed. At the most, Loeb mentions a passing and slight hyperemia. This possible explanation of the described action of colloidal copper on human tumors cannot, therefore, be entertained. Whatever the explanation may be, the fact remains that no traces of copper could be determined by chemical examination of the tumor tissues examined by us.

CRITERIA OF THERAPEUTIC EFFECTS

In determining the effects of any given mode of treatment on a tumor, a variety of criteria may be relied on. Circulatory changes in the tumor, the relief of pain and the restoration of a secondarily impaired function are certain of the criteria on which stress has been laid by the majority of observers in the past. Important as are these criteria in determining the progress of purely inflammatory processes, it is unquestionable that their value in judging of the effects of therapeutic methods when applied to malignant disease is open to criticism. It is a curious and interesting fact that almost every therapeutic claim made in recent years in connection with cancer has included among its virtues the relief of pain. This is true of vaccination with cancer tissue, of Hodenpyl's method and of many others. Loeb likewise observed it in his cases. In view of this very general effect, not much stress can be laid on this symptom, and it is probably fair to assume that in the great majority of these cases the result is in no small measure psychic. The improvement of function is also largely a subjective phenomenon, and as such requires most careful criticism. Osler relates that he has known a patient with gastric cancer to be relieved of digestive disturbances and to gain 18 pounds in weight as the result simply of the visit of a sanguine consultant who denied the presence of a tumor. Improvement in the ability to chew food, to articulate words or to move a limb are phenomena familiar to those who attempt to treat cases of cancer. The victims of this disease seem to be in a very high degree "suggestible" and impressionable and respond nobly to every therapeutic effort. We have therefore noted, but laid no stress on, this group of criteria.

Circulatory changes in tumors offer an interesting group of clinical symptoms. The observation has often been made, especially in ulcerated new growths, that treatment is associated with swelling, peripheral hyperemia, and an altered character of the discharge. In spite of the fact that there is no reasonable relationship between this congeries of symptoms and the actual cure of the tumor, they generally receive considerable emphasis and are cited as an indication of the specific local action of the agent employed. It may be stated by way of preliminary that these symptoms do, as an actual fact, sometimes accompany the administration of colloidal copper. Indeed, they are described in some detail by Loeb. It is also true, however, that the growth may continue to advance in spite of their presence. It is of some importance to inquire into the mechanism which produces these circulatory changes and into their clinical interpretation. It is a well-known fact that many drugs. when introduced into the body either by the mouth or through the skin, are excreted not only by the normal channels of elimination, such as the kidney or the intestine, but also from such ulcerated surfaces as may be present on the body. This is easily shown to be true, for example, of certain of the anilin dyes, which, when introduced by way of the veins, produce an intense discoloration of the dressings over ulcers. It is likewise true of certain of the metals, such as arsenic. In order to understand the series of events previously enumerated it is therefore only necessary to assume that copper, like many other substances, is excreted from the ulcerated surface of tumors. As an irritant, it will tend to produce hyperemia of the margins of the ulcer, and an increase of the secretions. As an astringent, however, it may produce just the opposite of these effects. Such a result, however striking, is purely accidental, and has no necessary bearing on the growth or destruction of the tumor itself. It constitutes a symptom on which no reliance should be placed.

Excluding from consideration all of these secondary factors, we may conclude that the observation of the size of the tumor itself is the sole criterion on which we can place reliance in judging of the effect of therapeutic measures. This implies, in the first place, that a tumor must be accessible to fairly accurate measurement. Tumors of the uterus, for example, and intra-abdominal growths will only exceptionally fall into this class. In the second place, indirect evidence of a decrease in the size of tumors, such as is afforded by the increased permeability of obstructed passages, as in the case of tumors of the esophagus, pylorus or intestine, must be accepted only with great reserve. Remissions in the obstructive symptoms characteristic of such tumors are a frequent feature of the normal evolution of the clinical history of such growths. The relief of obstruction, however, may be due either to necrosis of the obstructing portions of the tumor, while the remainder continues to grow progressively, or to a relief of the accompanying muscular spasm. Finally, evidence of decrease afforded by the roentgenogram is not sufficiently exact in most cases to afford ground for so important a conclusion as that at present in question.

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[5] Duhamel: Compt. rend. Soc. de Biol., 1913.

Not only must there be unquestionable evidence, however, of the diminution in size of the tumor, but this diminution must be of a kind not ordinarily attributable to the natural evolution of the tumor. For example, it is stated by Loeb that "a case of multiple carcinoma of the face and neck is markedly improved as a result of the treatment." Without venturing any opinion as to the conditions which obtain in Loeb's case, it is safe to say that multiple tumors offer enormous difficulties in the matter of interpreting therapeutic results. At present we have in the wards of the hospital a patient with multiple metastatic carcinomas of the skin. For several months we have at intervals made accurate measurements of certain of these tumors and have found that some have undergone retrogression, others have entirely disappeared, while still others have continued to grow steadily. In the case which afforded the ascitic fluid used in Hodenpyl's experiments, many of the lymphatic metastases underwent complete retrogression, while the metastatic process in the liver, as was demonstrated at necropsy, increased progressively, and ultimately almost destroyed that organ. Thus, in multiple carcinosis, the retrogression of individual nodules is no indication that therapeutic intervention has produced an improvement.

I shall not delay to emphasize those variations in the size of solid tumors which accompany hemorrhage and its absorption, edematous swelling, necrosis in the depths, and other familiar factors which clinically simulate, or induce, the softening and the reduction that are so often attributed to therapeutic interference. But it is important to draw attention to a similar feature in that type of superficial epithelioma known as rodent ulcer. These new growths not infrequently advance at one point of the periphery, while they recede at another, and thus cicatrization and contracture may simulate a partial recovery. This effect is due in part to alterations not in the growth itself, but in the accompanying ulcerative process. The secretions from the growths, especially if confined under dressings, may have eroded and destroyed the surrounding skin, and it is tempting to interpret a recession of the associated ulcerative disease as an indication of a favorable effect on the new growth. It is unquestionably this aspect of rodent ulcers which plays so generously into the hands of the numerous nostrum venders for this disease.

In brief, the demonstrable reduction in size of a tumor, of a kind not to be attributed to the natural processes of evolution of that tumor or of its associated lesions, is the one essential feature of effective therapeutic intervention.

THERAPEUTIC EFFECTS

The twelve cases treated by us included various types of new growth. There were two cases of cancer of the breast, one of which was very active and extensive; one case of cancer of the rectum; one case of metastatic cancer of the great omentum; two cases of superficial epithelioma, of face and of neck, respectively; four cases of sarcoma, and two cases classed tentatively as endothelioma. Of these cases, four received a thorough and prolonged course of treatment; four received between fifteen and twenty injections; in the remaining four the undesirable sequelae and symptoms of the method itself caused us to discontinue it, in spite of the fact that less than twenty injections had been given. I have chosen from fifteen to twenty injections as defining the meaning of an adequate test of the treatment in any case, in view of the fact that Loeb himself in his second communication states that after this number of injections no further improvement was, as a rule, obtained. In some of our cases, however, over thirty injections were given.

Judged by the therapeutic criteria which have been previously defined, our patients have failed to manifest any improvement under colloidal copper. Every other feature described in the preceding paragraphs we have witnessed—improvement in spirits, in a feeling of strength, in appetite, in function; improvement in the character of the discharge; increased hyperemia; in fact, every symptom of a specific effect, except the crucial condition, namely, a destruction of tumor substance. In the superficial epitheliomas there was so striking a change in the accessory features, notably in the character of the discharge, that careful and unprejudiced observers were positive that the tumor itself had improved; but accurate and regular measurements by means of calipers invariably demonstrated that the tumor itself had remained unaffected, and that there was, at one or more points in the periphery, a progressive advance.

In one case we observed certain apparent effects of the treatment which seem worthy of more detailed description:

Case 1.—*History.*—The patient, aged 45, entered the hospital Dec. 18, 1912. On admission he presented symptoms of extensive involvement of the right lung, and of an intracranial new growth; in addition he had a few large lymph-nodes in the right groin. In another hospital some of the lymph-nodes in the groin had been removed for diagnosis, and had been reported as endotheliomatous, a view in which Dr. Ewing concurred after a study of the sections. The important features of the case were the cerebral symptoms, consisting of severe headache, frequent attacks of projectile vomiting and a double optic atrophy with blindness. These symptoms had been present, with marked variation in intensity, for a period of two years. The patient had been sent in for a decompression, and begged for operation as a means of relief.

Treatment and Course.—From December 24 to January 1, the patient received copper almost daily; from January 24 to February 1, treatment was suspended; it was resumed on February 1 and continued to February 15. During this period he received, in all, over 11.5 liters of colloidal copper solution intravenously. By December 29, the headache had become much less severe, and vomiting had ceased. After the injections were stopped, January 24, there was a return of the symptoms, which again yielded to a second course of injections. The patient was improved in health and spirits during this time, in spite of the fact that he suffered severely from phlebitis. His weight remained constant. He was now discharged at his own request.

March 5, he was readmitted, complaining of severe vomiting, headache and deafness. For five days he received intravenous injections of small amounts of colloidal arsenic, but without improvement. In fact, his condition became complicated by the onset of delusions and delirium. March 17, copper was again administered, and continued daily in large amounts. There was marked improvement in a few days with the disappearance of all cerebral symptoms. The treatment had to be discontinued because of phlebitis. During this second course of treatment the patient received 9 liters. His weight fell from 108 to 102; his hemoglobin dropped from 67 to 62 (by corrected Sahli).

The case is certainly of great interest as indicating an apparent improvement consequent on the use of copper, on three separate occasions. In the absence of direct observation of the intracranial growths, however, judgment as to the mechanism of this effect must be suspended. The accessible new growths, namely, those in the groins, showed no alterations during the treatment. As regards remissions in the cerebral symptoms accompanying tumors, it is well known that they may spontaneously occur and that a person may manifest severe symptoms of intracranial pressure and within a comparatively short time again be free from them. This feature of intracranial tumors has been made the subject of a long and careful clinical analysis by Hawthorn,[6] in a series of studies recently published. It had long ago been recognized by Hughlings Jackson. The cause of these striking changes is, of course, unknown; but they have generaly been ascribed to circulatory variations in and around the tumors. The fact that just such changes may, and do, occur independently of treatment, illustrates the difficulty in interpreting the phenomena from the point of view of the therapeutist. At all events, in no other case did we observe any such striking coincidence between treatment and symptomatic improvement. It is entirely possible, however, that in cases of this type the use of colloidal copper might regularly be productive of favorable results of the character described.

CONCLUSIONS

The preparation described by Loeb as colloidal copper has been administered in twelve cases of malignant disease, in eight of which the treatment was thoroughly carried out. The treatment resulted in most of the cases in the production of mild constitutional effects, such as fever, chills, nausea, some loss in weight, slight reduction of hemoglobin, and occasional albuminuria or hemoglobinuria. Chemical analysis of two tumors from treated patients failed to reveal the presence of copper, while in a liver obtained at necropsy it was present in appreciable quantity. Judged by certain clinical criteria, which have been adopted as a reliable standard of therapeutic effectiveness, the treatment has not appeared to exert a destructive action on the tumor tissue in any of the cases.

CASE-REPORTS

Only such cases as seemed to offer data of special interest have been summarized.

CASE 2.—J. W., man, aged 44, admitted Jan. 23, 1913. Diagnosis: Papillary epithelioma of face. Growth on left side of face of ten years' duration, during which time it had been subjected to various modes of medical and surgical treatment. Growth on admission presented appearance of flat fungating mass, irregularly ulcerated. Purulent discharge, of ill odor; cicatrization, with marked contracture at one angle; sluggish granulations over the base of ulcer. Growth measured 8.5 cm. across, and 4 cm. from above downward. An accurate silhouette made with the help of calipers, and revised at end of each week of treatment.

Eighteen injections, from January 25 to February 17, totaling 7,300 c.c. Ulcer assumed a much more healthy look, granulations improved, discharge lessened and general appearance of growth greatly improved. Measurements made, February 20, showed increase of a little over 1 cm. in each diameter. Extensive and severe periphlebitis and thrombophlebitis. Treatment well borne. No albuminuria, but hemoglobinuria once. Weight fell from 201 to 190; hemoglobin, from 100 to 76 (by Sahli).

Operation: February 27. Radical removal, curettage and fulguration.

CASE 3.—S. L., man, aged 18, admitted Dec. 26, 1912. Diagnosis: Sarcoma of right upper jaw. First appearance of growth dates back seven months. External swelling measures 2½ inches across. No ulceration. General condition of patient excellent.

Treatment: Between December 27 and January 26, twenty-four injections, totaling 11.525 c.c. of copper solution; average almost 500 c.c. During this period measurements of growth were made at frequent intervals. Slow but progressive increase in size of tumor, at a rate which corresponded, so far as could be calculated, approximately with rate of growth previous to treatment. Patient persistently asserted improvement. No loss in weight, or change in general condition.

Operation: On February 4, removal by Dr. Coley. At present, June 1, no sign of recurrence.

Extract from pathologic report: "The section is composed chiefly of medium-sized spindle-cells, with slightly hyperchromatic nuclei and much finely fibrillar intercellular substance. . . . There are many small, irregular, bony and osteoid trabeculae, also many fine globules lying between the cells, which appear to be of osteoid nature. . . . *Diagnosis:* spindle-cell osteogenic sarcoma."

On admission patient had a faint systolic murmur. After operation he failed to recuperate properly. Weight fell from 117 to 100; hemoglobin dropped to 64. In spite of the absence of characteristic symptoms, the diagnosis of malignant endocarditis was made. This has been confirmed at Mount Sinai Hospital by blood-culture findings.

CASE 4.—L. N., man, aged 28, admitted Jan. 15, 1913. Diagnosis: Recurrent sarcoma of chest wall. Four years ago first observed lump under skin of chest. Removed in April, 1908. Recurred in 1909, and again removed. Recurred, and removed for the third time in 1910. Recurred, and treated by Coley's toxins, which proved ineffective. Fourth removal in 1912.

On admission to hospital, patient presented small hard mass, overlying fifth rib on right side. Mass measured 3.9 cm. by 2 cm. It was movable on the deep parts, and not attached to the skin.

From January 17 to February 7 patient received eighteen injections, totaling 6,800 c.c. During this time, loss in weight of 10 pounds. For a few days there appeared to be slight diminution in size of tumor, followed by a period of active and advancing growth; February 8, long diameter measured 4.8 cm.

CASE 5.—J. W., man, aged 54. Diagnosis: Epithelioma of neck. History of twenty years' duration. Ulcerated area measured 8 by 9.5 cm.

Between December 28 and February 1, sixteen injections, totaling 5,900 c.c. Marked phlebitis. Headache, nausea, chills, albuminuria, hemoglobinuria. Progressive improvement in granulations and diminution of discharge. Steady increase in size of growth as measured at intervals by calipers.

CASE 6.—F. A., man, aged 35, admitted March 27, 1913. History extended back almost two years, beginning with enlargement of the cervical lymph-nodes. On admission, chief complaints were difficulty in mastication, pain and paresthesias in the distribution of the second and third divisions of the trigeminus. General nutrition and strength, excellent. On each side of neck, masses of fused lymph-nodes, of moderate size, very hard and immovable on deeper parts. Paralysis of left abducens. Paresis of the temporomasseter and pterygoid groups on left side, and hypesthesia and hypalgesia in distribution of the second and third branches of left fifth.

Examination of nose and accessory sinuses, by Dr. C. G. Coakley, showed left posterior ethmoidal cells and sphenoidal sinus completely filled with hard masses of new growth. This finding confirmed by roentgenoscopy. Patient's weight, 145 pounds. Hemoglobin, 90 per cent. (by corrected Sahli). Urine, normal in every respect. Diagnosis: Primary tumor of nasal sinus, with metastases in cervical lymph-nodes and extension into cranial cavity, involving fifth and sixth nerves at base.

One of smaller lymph-nodes in neck removed for pathologic examination. On this, pathologic report was as follows:

"The node is largely replaced by an alveolar tumor in which there is considerable fibrosis. The cells are arranged in small groups or long anastomosing columns which are usually sharply separated from the connective tissue. Cells are large, polygonal, epithelioid, with pale bodies and multiple nucleoli. They often appear syncytial. There are many large vacuoles, and a great variety of cell inclusions. Diagnosis doubtful; either endothelioma, or epithelioma from transitional stratified epithelium."

From April 6 to May 22 the patient received thirty-five injections, totalling 15,200 c.c. Average, over 430 c.c. for each injection. During treatment no loss in weight or strength.

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[6] Hawthorne: Studies in Clinical Medicine, 1912, p. 71.

Hemoglobin fell from 90 to 79. Urine regularly showed small amounts of albumin, and occasionally hemoglobin in sufficient amounts to produce distinct discoloration. During first period of treatment patient said that he felt benefited, but toward end asserted that he had become worse. Progressive increase in size of the cervical masses. May 14, ophthalmoscopic examination revealed moderate swelling of both disks, with congestion of temporal halves. On admission the disks had been found normal.

In this case, therefore, there was a failure of the treatment either to hold the growth in check, or to induce any evident degenerative changes in it.

Case 7.—I. R., woman, aged 64, admitted Jan. 3, 1913. Four months previously patient observed lumps in abdomen. Dec. 20, 1912, operated on by Dr. Hartwell at Presbyterian Hospital. He reported an omental tumor; also a small growth on each ovary and one along greater curvature of stomach. "A specimen was taken for examination from the omental tumor, which proved to be carcinoma, the cells being arranged somewhat in tubular form, but the pathologists were unwilling to state the primary origin of the tumor."

On admission the omental tumor was demarcated as accurately as possible, and measurements taken. From January 16 to February 25, patient received twenty injections, totaling 5.225 c.c., and averaging 260 c.c. for each injection. Injections were well borne. Tumor, however, showed a steady increase in size.

In Cases 6 and 7, copper was prepared by electrolysis, as for the other cases, but with a somewhat different technic.

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SKIN RASHES FOLLOWING THE ADMINISTRATION OF ATOPHAN

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During the past two years atophan has been used extensively in the treatment of gout, arthritis of different forms and neuritis. Its use has also been recommended in migraine, sciatica, lumbago, iritis, episcleritis, otosclerosis, pyorrhea alveolaris, eczema and urticaria. The purpose of this paper is to call attention to the occurrence of various skin rashes—purpura, urticaria and scarlatiniform eruptions—caused by the administration of atophan as exemplified in the cases reported herewith.

REPORT OF CASES

Case 1.—Man, aged 56, who for twelve years had suffered from the polyarticular form of arthritis deformans, was first given atophan in July, 1911, 7½ grains being administered four times daily. Ten days later a purpuric eruption appeared over the anterior surface of the lower extremities, extending from the knee down to the dorsum of the foot. The lesions were in the form of numerous small petechiae. The medicine was discontinued and in ten days the eruption had entirely disappeared. A week later the medicine was given again in the same dosage and four days later the petechiae again developed, disappearing a few days after the atophan was stopped. Altogether during the past two years. the same experience occurred four times in this patient, that is, every time that this dosage of atophan was taken. It did not occur from smaller dosage.

Case 2.—Man, aged 45, with chronic arthritis of four years' duration, was given 7½ grains of atophan four times daily. Two days after its first administration a severe urticaria developed, affecting the body and extremities and lasting one week. In this patient the atophan was given again one week later, 30 grains of sodium bicarbonate being given with each dose, and the rash reappeared only in very mild form and disappeared again three or four days later without necessitating the stoppage of the drug. Whether or not the sodium bicarbonate was of value in preventing the occurrence of the urticaria is a question that might be raised.

Case 3.—Woman, aged 72, suffering from slight pain in the knees, was given 7½ grains of atophan three times daily. After the second dose numerous urticarial lesions appeared on the body and the medicine was discontinued. It was given again one week later and again the urticaria appeared.

Case 4.—Woman, aged 65, was seen in consultation because of very severe urticaria, affecting the body and extremities, which had persisted for one week. Atophan had been taken in 7½-grain doses three times daily for one month. The urticaria disappeared four days after the drug was stopped. In this case I had no opportunity to find out whether or not it would reappear if the drug was again given.

Case 5.—Woman, aged 53, with chronic arthritis of the left hip, was given 7½ grains of atophan four times daily. The next day a diffuse scarlatiniform eruption appeared over the entire body, extremities and face. This was unaccompanied by fever or sore throat, and disappeared in two days after the drug was stopped. The following week the atophan was again given in the same dose as before, and the next day the scarlatiniform eruption was present, disappearing as before when the drug was discontinued. This scarlatiniform eruption was accompanied by severe itching.

CONCLUSION

These cases show that skin rashes, resembling those following the administration of antipyrin, are not uncommon after atophan has been taken, and that this drug should not be given in the treatment of urticaria as has been advised. Müller[1] has called attention to the occurrence of a scarlatiniform eruption in the case of a girl, aged 23 years. In this patient from 2 to 3 gm. of atophan were given daily in the treatment of arthritis. In the discussion of Müller's paper, Porges mentioned the fact that he had seen urticaria in cases in which atophan had been given.

NERVE-BLOCKING AS A SUBSTITUTE FOR GENERAL ANESTHESIA IN SURGICAL OPERATIONS

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CHICAGO

Notwithstanding the inestimable advantages and blessings of general anesthesia as a method of inducing insensibility for surgical purposes, it is not without its serious drawbacks. In addition to the fact that most persons shrink from the idea of losing consciousness, general anesthesia has attached to it not only unpleasant aftereffects, such as nausea, vomiting, headache, pulmonary irritation, pneumonia, suppression of urine, etc., but also the occasional, unavoidable sudden death.

It has long been the hope of surgeons and experimenters that some method of inducing insensibility to pain might be discovered which would be free from all the objectionable features of practically all the present known methods of inducing general anesthesia, and this hope seems now to be realized. Physical pain is the perception of afferent impulses received from that portion of the body which is the subject of injury. If no impulses reach the brain from the injured part, no pain is felt. The impulses or stimuli are transmitted from the periphery to the centers exclusively by the sensory nerves. If the power of the nerves to transmit these impulses be temporarily suspended by any means, any amount of injury may be inflicted to the parts supplied by the nerves whose function is suspended without the patient being conscious of such injury. The newer method of inducing anesthesia consists in suspending temporarily the power of the nerves to transmit afferent impulses and is called nerve-blocking. Nerve-blocking is produced by infiltrating a small portion of the nerve somewhere in its course between the periphery and the spinal cord with some substance which temporarily suspends its action. Not only does nerve-blocking prevent absolutely all pain from the region blocked, but it likewise prevents completely all general shock from any injury received to the parts blocked.

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[1] Müller: Nebenwirkung des Atophans, Gesellsch. f. inn. Med. u. Kinderh., Feb. 13, 1913; abstr., Therap. Monatsh., xxvii, June, 1913, p. 468.

Shock may be defined as a condition in which there has been a sudden or rapid discharge of the potential energy of the nerve-centers, the result of afferent impulses or stimula, due to peripheral injury. Without afferent stimuli, shock cannot be induced. By blocking the nerve to the passage of afferent stimuli, shock as an element in peripheral injury is entirely and completely eliminated. A leg for instance, the nerves from which have been blocked, may be crushed without the slightest evidence of pain or shock to the patient. As a surgical operation in a sense is simply an injury to some part of the body, it necessarily follows from what has preceded that a surgical operation performed on any portion of the body the nerves from which have been blocked will be unaccompanied by either pain or shock. During general anesthesia no pain is perceived, but shock is always induced, the anesthetic notwithstanding. Every surgeon knows that shock is always present to a greater or less degree, in all operations performed under general anesthesia, the degree of shock depending on the amount of injury done and the duration of the operation, but it remained for Crile to demonstrate by experiment that even under profound general anesthesia afferent impulses are still received by the nerve-centers and that the potential energy of these centers is discharged by those impulses and thus shock results. Of course the shock is by no means so great as without the anesthetic, but it is an unavoidable element in every operation performed under general anesthesia, while under complete nerve-blocking, shock is absolutely and entirely eliminated. It may seem almost incredible to many that the flesh can be cut and the bone sawed with the patient in full consciousness, yet perceiving no pain and suffering no shock; but such is a fact. That consciousness is retained in these operations may seem to many to be an objection to the method, but I think that in the majority of the cases it is a distinct advantage. There is no unpleasant psychic effect, as might be supposed, and even in nervous persons and children I have found no trouble in this respect. In addition to the fear of loss of consciousness the horror which many persons have of an operation is based on the fear of pain. If unconsciousness and all pain and shock be eliminated the operation has been robbed completely of all its terrors; and this is exactly what nerve-blocking does.

Some months ago I began doing operations under nerve-blocking. The method proved so satisfactory in every way that its use was rapidly extended, until at present I do almost all of my operations by this method, and the use of a general anesthetic has become a rare exception. During this time I have operated on carcinomas of the face; tubercular glands of the neck; goiters and other tumors of the neck; carbuncles of the back of the neck; numerous affections of the extremities, including the plating of fractures; tumors of the abdominal wall; hernias; appendectomies, both acute and interval; gastrostomies; gastro-enterostomies; acute intestinal obstruction, due to volvulus and peritoneal bands; ovarian tumors; uterine fibroids; suprapubic and perineal prostatectomies; movable kidney; stones in the ureter and bladder; affections of the rectum, perineum and vagina, etc. It is unnecessary to give in detail all of these operations, but a few may be mentioned briefly to show what can be accomplished and how little effect operations done under nerve-blocking have on the patient.

REPORT OF CASES

CASE 1.—Mrs. R., aged 42, had, I think, the largest goiter that I ever attempted to remove. It was composed of three distinct masses, that on the right side extending so high as to displace the lobe of the ear; that in the midline extending from the chin to the sternum, while that on the left side extended considerably below the upper end of the sternum. It compressed the trachea so that she had great trouble in breathing. The operation was a difficult one and took nearly an hour and a half to complete. The patient talked to me repeatedly during the operation and expressed herself as suffering no pain. She left the table with a pulse of 88; it was usually 80 during the several days she was in the hospital before the operation. At the end of the operation she asked for a drink of water, which was given her. The next day she requested to be allowed to sit up, and made a rapid recovery.

CASE 2.—Miss G., aged 12, had been suffering for some time with a large bunch of tuberculous lymph-nodes of the neck which had broken down and had been partially operated on by some one before. The dissection was a difficult one and required the removal of a portion of the jugular vein. It was done by blocking the cervical plexus and not a particle of a general anesthetic was given. Twice during the operation she was asked if she would like to be put to sleep, but she said "No, go ahead and finish the operation." It is very evident that she suffered no pain, for being but a child of 12 she could not have controlled herself had she had any great pain. She had had ether for the first operation, which was small compared to this one, but she said she would not think of taking ether again for an operation.

CASE 3.—Mr. K., aged 56, had marked obstruction of the pylorus; fully 50 per cent. of a barium meal was still found in the stomach after twenty-four hours, as shown by the Roentgen ray. He vomited daily and had lost many pounds in weight. A diagnosis of carcinoma of the stomach was made. The abdomen was opened under nerve-blocking. No mass was found in the stomach or the pylorus, and there were no glandular metastases. The stomach was opened and explored thoroughly. The stenosis of the pylorus which was very marked was evidently benign in its origin. The stomach was closed and the usual posterior gastroenterostomy done. When the patient went to the operating-room his pulse was 72, and on his return from the operating-room it was 74. He expressed himself as scarcely knowing that he had been operated on.

CASE 4.—Mrs. M. had a large multilocular ovarian cyst, the size of an eight months' pregnancy. Operation performed under nerve-blocking. Extensive adhesions were found, fixing the tumor to the left parietal wall. The patient conversed during the operation and the only thing she said she felt was a peculiar drawing sensation in the abdomen when the tumor was turned out. She left the operating-room smiling and talking pleasantly with the nurse. She wanted to get up the next day.

CASE 5.—Mr. G. had a small sharp-angled stone lodged in the lower end of the left ureter, which was giving him a great deal of trouble. The nerves supplying the left lower portion of the trunk and pelvis were blocked. The usual extraperitoneal incision for exposing the lower ureter was made. The ureter was followed down as far as possible, but the stone could not be felt. The peritoneum was opened and the ureter palpated down to the bladder, but the stone still escaped detection. The peritoneum was closed and the incision carried downward and inward until the fundus of the bladder could be reached. The ureter was opened at the brim of the pelvis and a long probe introduced. The bladder was opened so that the finger could be inserted, and the stone could now be felt between the end of the probe in the ureter and the finger in the bladder. After some manipulation the stone was finally pushed on into the bladder and removed. The operation was long and tedious. The patient's pulse at the end of the operation was 86, during the several days that he was in the hospital before the operation his pulse had ranged from 76 to 80.

These cases are sufficient to show what can be done under nerve-blocking and to show the entire absence of shock even in very severe and prolonged operations. This absence of shock is very remarkable indeed. Not a single patient on whom I have operated under nerve-blocking has expressed a regret at not having taken a general anesthetic, but all have been delighted with the result and every one has stated that were he obliged to submit to another operation, he would not think of taking a general anesthetic.

The technic of the method is quite simple. The nerves supplying the part are infiltrated for a short distance somewhere between the part to be operated on and the spinal cord. The method is entirely different from the old intraspinal anesthesia. There are several substances which will block nerves in this way, among which may be mentioned cocain, the various forms of eucain, stovain, novocain, quinin and urea hydrochlorid, etc. Some of these are so toxic as to be unsuited to the purpose. The substances which I have used are novocain and quinin and urea hydrochlorid, the former in solution 0.0025 : 0.01 with the latter 0.0025 : 0.005 solution. These substances are but very slightly toxic and may be used to the extent of several hundred cubic centimeters, depending on the strength of the solution. The exact points of injection naturally depend on the region to be blocked. The idea is to block all of the nerves supplying the part to be operated on. One must have an accurate knowledge of anatomy and some experience in order to reach the right points successfully. After the injection, it requires from five to thirty minutes for the anesthesia to become complete, depending on the place of injection and the size of the nerve to be infiltrated. As the method requires some skill and practice to secure perfect results, we see opened up here a new field for the expert anesthetist or nerve-blocker, one who in a busy clinic can have the patient ready for the operator at the right time. The method is so simple, so successful, and possesses so many advantages that it opens up a new era in surgery and I believe marks the passing of the general anesthetic in surgical operations. Fuller details regarding technic and points of injection will be enlarged on in a future paper.

32 North State Street.

"What I Have Said, I Have Said," or The Folly of Always Adhering to One's Original Diagnosis.—Moynihan said that some surgeons seemed to think that it was a humiliation for them to open an abdomen, after making a diagnosis on reasonable grounds, and not to discover the particular condition which they had supposed to be present. He had himself no compunction in throwing his diagnosis aside as soon as it was found to be wrong and going in search of something else. . . . And if any precedent was required it could be found in the example of Saul, who went in search of his father's asses and found a kingdom. The one thing against which he could not inveigh too strongly and too constantly was that of making the diagnosis, not verifying it at the operation, but proceeding, nevertheless, to the performance of the operation originally planned.—(London) *Clinical Journal.*

MANGANESE TOXICOSIS

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From the paper of L. Casamajor[1] I learn that in the mines and factories of America cases of manganese toxicosis occur not infrequently; cases such as have been described, first, in 1823, by Couper; in 1901 by myself[2] and Embden and then by Friedel. That induces me to communicate briefly to my American colleagues my clinical observations in connection with that interesting and well-known morbid state.

I think that the nervous affections among workmen in factories who are occupied with the production of potassium permanganate and among workmen in mills who are working in an atmosphere full of dust of manganates and in workmen in manganese mills, are produced through the inspiration of dust containing manganates.

I reach that conclusion from the circumstance that in the factory from which I gathered my observations, after the spread of dust had been prevented, the workmen were thenceforth free from such affections.

The symptoms are the following: In the beginning of the disease there occur convulsive laughter, weeping and mental alterations of every kind. In the progress of the disease comes a period during which the patients show the symptoms of retropulsion and a complex of symptoms which resembles the Romberg symptom, but differs somewhat from it. At this time one finds spastic gait, increase of the tendon reflexes, no alimentary glycosuria. Babinski's reflex occurs by plantar flexion in the physiologic way. One observes, further, increased salivation, mask-like expression of the face and monotonous voice. Later on the mental symptoms recede and one observes a gait which is characterized by the patient's stepping forth with the metatarsophalangeal joint first. The prognosis as to life is good, as to recovery bad. The affections may show a standstill; the symptom of retropulsion and the pseudo-Romberg symptom may vanish, but in well-developed cases the gait I here describe persists so that complete restoration is scarcely probable. But I do not deny that slight affections occur which may be cured without persisting gait-troubles after the ceasing of the symptoms described above.

The diagnosis is easily made from the circumstance that people showing those symptoms are usually found occupied in the production of potassium permanganate; in manganese mills and in mines containing ores rich in manganous oxid.

Experiments with dogs, in order to produce the disease by allowing them to inspire a dust full of manganates through a period of months had no results. The treatment consists in the use of cold-water cures, physical exercises, use of the walking-chair (described by me), use of electricity in the form of galvanization, faradization and high-frequency.

I desire to mention that I observed a case from such a factory which showed similar symptoms, and, besides, a marked reduction of the white and red fields of vision, and yet, after a very short time, the patient recovered. Therefore, I think that we must recognize in this case—

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[1] Casamajor, Louis: An Unusual Form of Mineral Poisoning Affecting the Nervous System: Manganese? The Journal A. M. A., March 1, 1913, p. 646.

[2] von Jaksch, R.: Die Vergiftungen, Ed. 2, Vienna, Leipsic, Hölder, 1910.

the patient being a very intelligent workman who watched with terror the disease of his fellows—a case of manganophobia.

Finally, I mention that I could not succeed in discovering manganese compounds in the urine even after examining great amounts of urine from many such patients together. Nor could I find any evidence of this in such cases in the post-mortem examination.

REPORT OF A CASE OF MONOCULAR PARALYSIS OF THE ACCOMMODATION DUE TO LUES

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The following case is thought to be worthy of recording, not only because of the comparative rarity of the condition, but also with the belief that the lesion was probably prodromal of a more serious central nervous system involvement, which has probably been prevented, and certainly has been stayed by prompt antisyphilitic treatment.

Mr. N. S. D. was referred to me Jan. 28, 1913, by Dr. Thomas R. Boggs, through whose courtesy I am now at liberty to report the case. The patient had had syphilis five years previously and at that time had been under treatment for eighteen months; since then his general health had been excellent. On January 12, following a long stretch of book work, to which he was unaccustomed, he had felt a fluttering sensation in the left eye and a day or so later had noticed that the vision of that eye was quite blurred for reading. The condition continuing, he came to Baltimore for an examination. Following a general examination by Dr. Boggs, which disclosed nothing of importance except a positive Wassermann reaction, I found the following eye condition:

Right Eye: Pupil normal in size, responding normally to light. Fundus normal. Vision 20/20. Punctum proximum, 18 cm.

Left Eye: Pupil partially dilated, responding very sluggishly to light. Fundus normal. Vision 20/30 (with + .50 sp. ⌒ + .25 cy. ax. 90° = 20/20). A plus 4 D. sp. lens was required to bring the punctum proximum to 18 cm. Field normal for white, blue and red.

Consensual reaction from right to left, very slight. From left to right, normal. The right pupil responded to accommodation, the left did not. Both pupils responded to convergence.

The condition was clearly a paralysis of the accommodation of the left eye with probably a slight involvement of the sphincter pupillae. Wilder[1] reports two similar cases and quotes Hosch's records of five cases and Alexander's report of twenty-eight, all luetic. The lesion is probably nuclear and lies between the sphincter nucleus and the point where the fibers from the ciliary nucleus joins the pupillary light reflex bundle.

Under the direction of Dr. Boggs, the patient was given an intravenous injection of salvarsan and placed under appropriate treatment.

Feb. 23, 1913, the patient reported by letter as follows:

> Physically I am feeling fine and the vision of the left eye is much better. I can now read newspaper print with that eye at short range, though there is still some haziness. The pupil is somewhat larger than that of the right eye, but it is hardly noticeable.

July 9, I had the privilege of again examining Mr. D. and found that the pupils were equal, the accommodation of the left eye had completely recovered its normal functioning and the reflexes were normal. A Wassermann test gave a negative reaction.

506 Cathedral Street.

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[1] Wilder: Ann. Ophth., April, 1897.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. THEIR ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT AND IN PART ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS ARE ASKED FOR TO AID IN THE REVISION OF THE MATTER BEFORE PUBLICATION IN THE BOOK "NEW AND NONOFFICIAL REMEDIES."

THE COUNCIL DESIRES PHYSICIANS TO UNDERSTAND THAT THE ACCEPTANCE OF AN ARTICLE DOES NOT NECESSARILY MEAN A RECOMMENDATION, BUT THAT, SO FAR AS KNOWN, IT COMPLIES WITH THE RULES ADOPTED BY THE COUNCIL.

W. A. PUCKNER, SECRETARY.

GLUTEN FOOD A, Barker's.—Barker's gluten food A is gluten flour prepared from wheat and contains not more than 4 per cent. of carbohydrates and 87 per cent. of protein.

Barker's gluten food A is made from wheat flour by elutriation. It is a granular powder practically without odor or taste and is insoluble in water.

Actions and Uses.—Barker's gluten food A is indicated when a diet practically free from carbohydrates is desired, especially in most forms of diabetes. It can be taken uncooked or made into muffins.

The nutritive value of 500 gm. of Barker's gluten food A corresponds to 1850 calories, of which 1740 are due to protein, 80 to carbohydrates and 30 to fat. (Rep. Conn. Agr. Exp. Sta., 1913, Part 1, p. 18.)

Manufactured by Herman Barker, Somerville, Mass. No U. S. patent or trademark.

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Barker's gluten food B is made from wheat flour by elutriation. It is a granular powder practically without odor or taste and is insoluble in water.

Actions and Uses.—Barker's gluten food B is indicated when a diet practically free from carbohydrates is desired, especially in most forms of diabetes. It can be taken uncooked or made into muffins.

The nutritive value of 500 gm. of Barker's gluten food B corresponds to 1870 calories, of which 1700 are due to protein, 140 to carbohydrates and 30 to fat. (Rep. Conn. Agr. Exp. Sta., 1913, Part 1, p. 18.)

Manufactured by Herman Barker, Somerville, Mass. No. U. S. patent or trademark.

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Actions and Uses.—Barker's gluten food C is indicated when a diet practically free from carbohydrates is desired, especially in most forms of diabetes. It can be taken uncooked or made into muffins.

The nutritive value of 500 gm. of Barker's gluten food C corresponds to 1880 calories, of which 1680 are due to protein, 170 to carbohydrates and 30 to fat. (Rep. Conn. Agr. Exp. Sta., 1913, Part 1, p. 18.)

Manufactured by Herman Barker, Somerville, Mass. No. U. S. patent or trademark.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street . . . Chicago, Ill.

Cable Address . . . . "Medic, Chicago"

Subscription price . . . . . Five dollars per annum in advance

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SATURDAY, SEPTEMBER 27, 1913

THE GASTRIC MOVEMENTS IN HUNGER

The detailed experimental analysis to which the physiology of hunger has been subjected by Cannon of Harvard and Carlson of Chicago has revealed a large number of facts of immediate import made doubly valuable because in many instances they were ascertained or controlled on man. It is now clear that the sensation of hunger, or the "hunger pang," is due to periodic contractions of the empty stomach rather than to some less definite temporary nutritive condition or state of the blood. We have already commented[1] on the further fact that the hunger contractions can be controlled. All stimuli that act on the end-organs of taste and general sensation in the mouth cavity, as for example in the case of chewing palatable food during hunger, reflexly inhibit these gastric movements.

In searching for the actual cause of the hunger contractions of the empty stomach, the stimulus for which might be conceived to be some condition of the blood or sought in the vagus tone or in a primary automaticity of the gastric neuromuscular mechanism, Carlson[2] has discovered further inhibitory phenomena of not a little interest. Water, at body temperature or nearly ice-cold, acting directly on the gastric mucosa inhibits the tonus and the hunger contractions of the stomach. All acids, or liquids containing acids, including normal human gastric juice, check these movements of the empty stomach. The duration of the acid inhibition is said to be determined in all probability by three factors: (1) passing of the acid into the duodenum, (2) fixation and neutralization of the acid by the mucous gastric secretion, and (3) neutralization by bile and intestinal juice which at times pass into the stomach through the dilated pylorus. The degree of inhibition produced by normal gastric juice is the same as that caused by an equal quantity of hydrochloric acid of a concentration equal to the free acidity of the gastric juice. It would thus seem that the hydrochloric acid in the gastric juice constitutes the stimulus that leads to the inhibition.

These striking features at once bring to mind what seems to be a contradictory fact, namely, that such acid inhibitions do not become manifest during the gastric movements in normal digestion, although the stomach is frequently filled at such periods with strongly acid secretion. Indeed, there is reason to believe that during digestion a certain degree of free acidity actually facilitates the digestive movements. Carlson has pointed out that it does not follow, because acid in the stomach inhibits the hunger contractions but not the digestion contractions, that the mechanisms involved in these two types of gastric activity are necessarily different, for the digestive movements involve primarily the pyloric end, while the hunger movements involve the fundus of the stomach. It is possible that acid stimulation of the nerve endings in the gastric mucosa leads reflexly to inhibition of the fundus and peristalsis of the pyloric region of the stomach.

Trials with alkalies make it clear that alkalinity has the same effect on the hunger contractions as acidity only to a lesser degree. Most striking, however, is the unexpected, yet undeniable outcome of the investigation regarding the effect of alcoholic beverages on the hunger contractions of the stomach. From the wide-spread belief that a glass of wine, beer or other alcoholic fluid taken before meals increases the appetite (and perhaps the hunger), and from the authentic statements that a drink of wine seems to initiate the sensation of hunger, one would expect to find that the tonus and gastric contractions which give rise to it are distinctly augmented by these beverages. The results proved to be the very opposite. Wine, beer, brandy and pure alcohol introduced directly into the empty stomach inhibit the hunger contractions of the organ instead of increasing them. Indeed, they cause inhibition only. As a possible explanation for this paradox we may cite some of Carlson's comments regarding the failure of alcoholic beverages either to initiate or to increase hunger. He says that since most alcoholic beverages stimulate the end-organs of taste and smell as well as those of general sensibility in the mouth cavity and in the esophagus, it is possible that this stimulation in some way augments or initiates appetite for food. If this is true we have the singular phenomenon of alcoholic beverages augmenting appetite and inhibiting hunger at the same time. There can be little doubt that cerebral states as modified by training and habit are also a factor in the apparent action of alcoholic beverages on appetite. It is certain that a person's first taste of them does not focus his attention on food and eating. If alcoholic beverages in the stomach caused as marked inhibition of the stomach movements in digestion as they do in the case of the stomach movements in hunger, even moderate drinking with meals would speedily lead to acute indigestion. Inasmuch as this is not the case, the assumption seems warranted that alcoholic beverages affect the mechanisms of the two types of movement differently.

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[1] The Stomach in Hunger, Editorial, The Journal A. M. A., Feb. 8, 1913, p. 448.

[2] Carlson, A. J.: The Influence of Stimulation of the Gastric Mucosa on the Contractions of the Empty Stomach (Hunger Contractions) in Man, Am. Jour. Physiol., 1913, xxxii, 245.

As a corollary to the fact that acids as well as normal gastric juice inhibit the hunger contractions of the stomach, it may be supposed that persons having gastric hypersecretion or hyperchlorhydria experience little or no true pangs of hunger of gastric origin. We are not familiar with clinical observations on this point. It is by no means impossible, however, that in cases of prolonged hypersecretion the inhibitory influence of the acid on the overstimulated mucosa is gradually abolished so that a readjustment and restitution of hunger phenomena may occur even in such cases.

THE TRUTH ABOUT OZONE

The necessity for taking with critical doubt statements and claims made by those who have for sale something of claimed prophylactic or therapeutic value, is again demonstrated by the articles elsewhere in this issue on ozone. By the manufacturers of ozonizing machines ozone has been vaunted as a valuable remedy in many diseases, as an effective room disinfectant, as a "purifier of the air" and a restorer of exhausted human vitality. How misleading and even mischievous such claims are is shown by the detailed investigation and discussion of the ozone question by Jordan and Carlson. Ozone is a *toxic gas. So far as the evidence goes ozone* produces no reaction in the human organism or in the lower animals that can be regarded as in any degree beneficial either in combating or warding off infectious disease. On the contrary, all appreciable physiologic changes produced by the inhalation of ozone are distinctly of an injurious and weakening character.

The claims made for ozone as an aid to practical room ventilation would be farcical if they were not altogether deplorable. So far as the destruction of bacteria is concerned ozone is of no practical importance. The experiments of Jordan and Carlson are independently confirmed by the work of Sawyer, Beckwith and Skolfield, also published in this issue of THE JOURNAL. The results of all scientific investigation of this subject, in fact, are in substantial accord. An amount of ozone that can be tolerated in the air of a room by human beings has no bactericidal action. Even much larger amounts are relatively inactive and feeble compared with other well-known gaseous disinfectants.

As a "deodorizer" ozone is of dubious value. While in very great concentrations ozone seems capable of oxidizing some odorous substances, it is without effect on others, as for example, ammonia vapor. The "deodorizing" effect of ozone is, however, largely a masking effect due in part to the intensive odor of ozone itself (very disagreeable to many persons) and in part perhaps to fatigue or anesthesia of the olfactory epithelium. We agree with the authors cited in the statement that "it is probable that the injury to the respiratory tract by ozone in sufficient concentration to act as an effective mask is of greater moment than the deleterious action of most odors." Why try to mask or destroy odors when they are simply a danger-signal that ought to be heeded?

The claim that the operation of an ozonizing machine in a room makes the occupants "feel better" and display more energy is beside the point. So do other irritants. So does a cocktail—temporarily. Any device for whipping up a fagged brain, whether inhalation of a poisonous gas or something else, will seem to unobservant people to be of benefit. At how great a cost their temporary burst of energy or feeling of well-being may be secured is well known. It is quite possible, furthermore, that some of the effects attributed to ozonizers in "freshening" the air are nothing but the results of air currents which, as is well known, favor heat regulation by the body, and differ in no wise from the results obtainable by a simple electric fan. There is in fact no evidence that can reasonably lead us to add a poisonous gas, such as ozone is, to the air of rooms or to administer it to a patient.

One aspect of the matter is the responsibility of reputable and honorable manufacturers for the exploitation of cures and remedies. We do not for a moment question the good faith of many who have urged the use of ozonizers or their belief in the efficacy of their wares. It is easy, however, for those whose business it is to convince others of the worth of their merchandise to begin by convincing themselves with insufficient evidence. To all such we would commend for consideration that little fable with which the clear-thinking and plain-spoken young physicist Clifford prefaces a discussion of "The Duty of Inquiry." "A shipowner was about to send to sea an emigrant ship. He knew that she was old, and not over-well built at the first; that she had seen many seas and climes, and often had needed repairs. Doubts had been suggested to him that possibly she was not seaworthy. These doubts preyed on his mind and made him unhappy; he thought that perhaps he ought to have her thoroughly overhauled and refitted, even though this should put him to great expense. Before the ship sailed, however, he succeeded in overcoming these melancholy reflections. He said to himself that she had gone safely through so many voyages and weathered so many storms that it was idle to suppose she would not come safely home from this trip also. He would put his trust in Providence, which could hardly fail to protect all these unhappy families that were leaving their fatherland to seek for better times elsewhere. He would dismiss from his mind all ungenerous suspicions about the honesty of builders and contractors. In such ways he acquired a sincere and comfortable conviction that his vessel was thoroughly safe and seaworthy; he watched her departure with a light heart, and benevolent wishes for the success of the exiles in their strange new home that was to be; and he got his insurance-money when she went down in mid-ocean and told no tales.

"What shall we say of him? Surely this: that he was verily guilty of the death of those men. It is admitted that he did sincerely believe in the soundness of his ship; but the sincerity of his conviction can in no wise help him, because *he had no right to believe on such evidence as was before him*. He had acquired his belief, not by honestly earning it in patient investigation, but by stifling his doubts. And although in the end he may have felt so sure about it that he could not think otherwise, yet inasmuch as he had knowingly and willingly worked himself into that frame of mind, he must be held responsible for it."

HEALTH AND FINANCE

It has been said that this is an age which places an ever-increasing emphasis on the relation of good health to individual hygiene, to social effectiveness, to general prosperity. Other things being equal, the race is to the community whose children thrive and whose workers keep well. As relates to the community, at least, human health is a purchasable commodity, as has been repeatedly demonstrated. Cuba, Panama and the Philippines afford examples, each, however, under control as to forces and expenditures differing from those of the ordinary community, but confronting conditions infinitely more difficult. And even at that the expenditure has not been relatively great. The average community is in far better position to purchase health.

New York City, with its advanced health ordinances and comparatively liberal supply of money to carry them out, is a striking example of what an urban community can do in the way of a radical reduction in infant mortality and in the general death-rate. Yakima County, Washington, is another example showing the result of systematic health work and liberal expenditure in a rural district. In twelve months under a full-time health officer, with a well-equipped laboratory and a corps of visiting nurses and sanitary inspectors, the death-rate in the county from typhoid fever was reduced from 128 per hundred thousand to sixteen, and the deaths from all causes fell from 538 in 1911 to 393 in 1912. Other instances of like effective work might be cited.

As the mayor of Colorado Springs said recently in welcoming the delegates to the meeting of the American Public Health Association, the problems of public health are even more vital than those of individual health. Appreciation of this fact comes slowly. Money to purchase public health is given grudgingly by those in charge of the public purse. For instance, St. Louis, the fourth city in the United States in both population and manufactures, spends annually only $100,000 on its health department, whereas it spends $2,000,000 annually on its police department, twenty times the amount spent for the promotion of public health. It might be added that a large portion of this expenditure for police protection —and this applies to all cities—is made necessary by the tolerance of the saloon and the brothel, two important direct sources of ill health (as well as crime) which add to the burden of the health department with its inadequate appropriation. Larger appropriations for health purposes will only follow the creation of public sentiment demanding them, and in accomplishing this the newspapers must perhaps play the chief rôle. The St. Louis *Republic*, recognizing this, has applied itself to the creation of a public demand for better support of the health department of St. Louis, and will present a plan for making that city the healthiest in the United States. At present the death-rate in that city is considerably less than that of other large cities in the same latitude, and almost as low as that of Cleveland, New York and San Francisco, cities more favorably located geographically and climatically; but it is believed that it can be made still less. This commendable object will require not only increased appropriations for the health department, but the sustained cooperation of all the citizens, and it is this cooperation which, with an intelligent grasp of the requirements, the *Republic* has begun a campaign to secure.

The newspapers and the citizens of every community should awake to the fact that community health is a first principle of effective local government, and should adopt for their slogan, Public Health Is a Purchasable Commodity.

THE NUTRITION OF THE POOR

These are days in which problems of economy in living are forcing themselves on the attention of the public mind. The rise of prices has intruded itself into the conduct of the household and compelled a readjustment in some cases in the distribution of income among the various channels of expenditure. Whatever else may happen, it is fundamentally necessary that certain indispensable requisites of clothing, shelter and food be provided if the individual is to be maintained in a state of physiologic equilibrium and economic efficiency. In the so-called "better classes" the appropriations to such purposes can be adjusted without serious difficulties; but as we descend in the scale of available income a border-line is reached at which the barest necessities of life may not always be suitably provided. It is to this stratum of society that the attention of social workers and students of nutrition alike must be directed if reforms are demanded and deserve to be established.

So much has been written about the influence of diet on the physical conditions of the individual, and particularly on growing children who become the workers of the next generation, that most statements in this field appear like trite truisms. There are statistics to indicate that when the weight of children is much below the average for their age, almost without exception their diet is inadequate. This is a single illustration of the way in which the physiologic, and consequently the economic, welfare of the individual among the poorer classes becomes seriously menaced in the struggle for existence. Inasmuch as food is the fuel—the source of energy—of the human machine as well as the very material out of which the body is constructed, man's diet must be seriously considered not only during the years of growth, when the drain on the body's resources is commonly supposed to be peculiarly severe, but also throughout his working years. The facts have been bluntly, yet effectively expressed by saying that under natural conditions of trade the working man brings into the market his energy—his power of doing work—and obtains for it the most favorable price that he can. His ultimate power as a wage-earner is being influenced by the character of his food-supply. His profits depend, on the one hand, on the amount of energy he can supply and the price at which he can sell it, and, on the other, on the price for which he can buy his source of energy—his *food*. We refer here particularly to the wage-earning working man, because the amount of food required depends so largely on the amount of work to be done. An abundance of cheap and good food is the first essential for a productive working class.

The late Professor Atwater and his associates in this country have devoted much attention to the food requirements of the working classes and to the cost of living involved thereby. The standards thus obtained have proved of great value in sociologic studies. Examining the conditions in New York City a few years ago, Professor Underhill found that at that time it required an expenditure of considerably more than twenty cents a day to secure the nutriment adequate for the working classes investigated. Small indiscretions in the direction of inexpedient purchases of food readily raised the cost of the minimal requirement. In collaboration with Prof. Noël Paton, Miss Dorothy Lindsay[1] has carried out a most interesting study of the diet of the laboring classes in the city of Glasgow, Scotland, during 1911 and 1912. The inquiry was directed to ascertain whether the working classes of that city get such a diet as will enable them to develop into strong, healthy, energetic men and enable them to do a strenuous day's work, or whether the conditions of the laboring classes are such that a suitable diet is not obtainable. Furthermore, attention was directed to the pertinent question as to whether, if a suitable diet is obtainable, its cost is low enough to leave a margin of income sufficient to cover the other necessary expenses of the family life, with something over for those "pleasures and amenities without which the very continuance of life is of doubtful value."

The Glasgow report, like others that have preceded it, shows how important such investigations are at the present time. In view of the agitation in many quarters for compulsory insurance, it is well to bear in mind as Dr. Paton points out, when dealing with the almost dependent classes, that a very small contribution even for problematic benefits in future years may decrease the expenditure on the family diet, and the benefits may thus be bought at too great a price.

Accepting the standard of energy requirement adopted by the Glasgow investigators, it appears that in the case of the really poor—*those who* have a daily struggle to make both ends meet—*even although*, as the statistics show, three-quarters of their meager income is expended on food, a sufficient supply is not obtained, and that the remaining fourth of the income is quite inadequate to defray the necessary outlay on rents, coal, taxes, insurance, etc., while absolutely nothing is left for expenditure on amusements of any kind. The families in which the income is under 20 shillings a week entirely fail to obtain a supply of food sufficient for their needs. Some of the actual facts discovered are worth reciting here. The average daily energy value of all the diets of workingmen's families studied in Glasgow was 3,163 calories, including 110 gm. of protein, 83 gm. of fat and 473 gm. of carbohydrate. Of the protein about two-thirds came from vegetable sources. The principal foods used were bread, potato, milk, sugar, beef and vegetables, such valuable and easily procured products as oatmeal and peas being used in relatively small amounts. Not one of the families in which the wage was regular and under 20 shillings per week had a diet the energy value of which reached the minimum of 3,000 calories per adult man. With increase in income, however, the energy content of the dietary advanced.

One naturally asks what can be done to improve such diets, since it is not within the province of the dietitian directly to alter the financial return to the families. It appears on closer survey of the situation that ignorance and bad marketing play their part as well as penury. The protein-rich animal foods, flesh, fish and eggs, are all too expensive for the laboring classes, and any increase in their proportion in the diet is impracticable. The Glasgow physiologists wisely point out that cheese and the cheap protein-rich vegetable foods, oatmeal, peas, beans, etc., should be more freely used. The chief drawback of the latter is the labor entailed in preparing and cooking them. Here lies an opportunity for a wholesome reform in the technic of the food industries. If the diet of the laboring classes is to be improved decidedly, without increasing the cost, time and labor must be expended on properly preparing the more nutritive foods of vegetable origin for the ready use of man.

Dr. Paton believes that the experiences in Glasgow and Edinburgh teach the same lesson—that what is needed is a partial return to the national dish of porridge and milk, in place of tea, bread and jam which have so universally replaced it in towns and are winning favor even in the rural districts. There is probably little advantage in preaching the value of these old-fashioned dishes. Presumably nothing short of exhibiting the value of different foods, of training in marketing and cooking in schools will have an influence on the future. There is an opportunity here for a splendid propaganda on how to spend money for food to best advantage and how to cook it in the most palatable form. These are not fads; they are the essence of life in a keen struggle for existence.

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[1] Lindsay, Dorothy E.: Report on a Study of the Diet of the Laboring Classes in the City of Glasgow, Carried out during 1911-1912 under the Auspices of the Corporation of the City; with an Introduction by D. Noël Paton, M.D., Physiological Department, University of Glasgow, 1913.

MILITARY INSTRUCTION FOR MEDICAL STUDENTS

At Gettysburg, Pa., from July 7 to Aug 15, 1913, and at Monterey, Cal., from July 1 to Aug. 8, 1913, two military-instruction encampments were held, attendance at which was permitted only to students from non-military schools. The War Department in projecting these camps, held in consideration the plan, should this experiment be successful, to hold similar encampments annually in each section of the country. The object sought is to augment our small military reserves by a well-trained class of men from whom in time of national emergency a large proportion of commissioned officers could be drawn.

All students physically qualified and properly recommended, who are over 17 years of age, may volunteer for these camps and for the time being must render themselves subservient to military discipline. Instructions and exercises include the application of proper health precautions in camp and on the march, personal hygiene, instruction in military tactics and handling of troops under the conditions of battle. Instruction is also afforded in the care of troops in the field, in the duties of the officers of the medical corps during an engagement with the enemy, on the proper way of removing the wounded from the battle-field to the rear, and on allied subjects. Instruction in shooting is provided and the regular badge for markmanship of the National Rifle Association of the United States is bestowed on those students who make the requisite score. Afternoons and evenings are at the disposal of the student, subject to proper supervision and to military necessity. Opportunity is afforded for acquiring horsemanship and practice is given in riding artillery caissons and horses. Students coming from one institution of learning, if they desire, will be allowed, so far as it is practicable, to be members of one company and will be permitted to share one or adjoining tents. Men selected from among the students will be appointed aids to the company commanders.

The student is thus given a healthy outdoor life for the summer at less expense than is usually required; he acquires habits of obedience, command, self-control, order and personal hygiene; he gains the benefit received from intercourse with students of other institutions, and he has an opportunity to become skilled in athletics and to obtain a knowledge of military art. A certificate is given to each student who attends throughout the entire encampment. Details as to needed equipment, uniform, etc., will be supplied on application to the War Department.

It would unquestionably be well for medical students to volunteer for admittance to these camps. The advantages offered are obvious to the ambitious student desirous of becoming a military surgeon. Those unambitious in this direction would gain an experience of sanitary measures which would be helpful in routine medical practice.

THE THEORY OF ARSENIC THERAPY IN ANEMIAS

Arsenic is one of the drugs most frequently prescribed in various forms of anemia and is probably the one on which the great majority of physicians still rely in the treatment of certain types. Whether or not this therapy has any considerable influence over the course of a disease like pernicious anemia, and even whether or not it is always free from objections, may well be open to question. Although iron and arsenic are commonly depended on to hasten the process of blood regeneration, the entire question of the mode of their action is decidedly obscure. It is always difficult, if not impossible, to estimate to what extent rest and nutrition—in other words, good hygienic measures—contribute to the outcome ascribed to the "stimulating" or "tonic" effect of drugs of the class here included, which is politely clothed with the designation "alterative."

At one time we were taught to assume that arsenic initiates the new formation of blood by virtue of an action directly on the hemopoietic organs, notably the bone-marrow. This point of view has been in part abandoned of late in so far as the marrow has been looked on as the immediate seat of stimulation by the drug. Arsenic is a blood-poison and is currently believed to lead to a destruction of red corpuscles in the peripheral regions of the circulation. Hemolysis and loss of erythrocytes are, however, of themselves provocative of regenerative processes. The organism responds to lack of blood elements and loss of oxygen-carrying power in the circulation by the production of new corpuscles. On this basis we may accordingly believe that arsenic induces a restoration of blood elements not because it directly stimulates the localities concerned in their production, but rather because by causing an actual destruction of corpuscles it indirectly furnishes the occasion for a secondary vigorous compensatory repair of the damage.

Is this hypothesis tenable? Does arsenic act on the blood alone or on the blood-forming organs? The participation of the latter, when it occurs, is made manifest by the presence of "youthful" types of blood-corpuscles, newly formed erythrocytes in the blood. These cells have morphologic features in the guise of nucleated characteristics which betray them to the microscopist. Even more significant, perhaps, is another mark of "newly made" blood, such as that encountered in the regeneration which attends anemias. Morawitz and others have shown that the erythrocytes of circulating blood under normal conditions exhibit no phenomena of "respiration," that is, oxygen consumption. In anemia, however, there is a very marked absorption of oxygen and production of carbon dioxid on the part of the blood-cells. This is so conspicuous and characteristic of regenerated blood that it can frequently be detected chemically even when the morphologically characteristic nucleated or polychromatic new erythrocytes cannot be discerned. Here, then, is a "test" for the occurrence of regenerative changes in the blood. When it is applied to the behavior of the blood after administration of arsenic the facts observed are the following:[1] Large, toxic quantities produce a mild anemia. The arsenical anemia is hemolytic in character and attended by active compensatory regenerative responses which can readily be detected by the method of estimating oxygen-consumption just referred to. On the other hand, when small doses of arsenic comparable with what are employed in human therapy are experimentally administered to animals, there is no evidence of initial anemia or of consequent regeneration. These facts speak clearly against the theory of compensatory regeneration ascribed to the action of arsenic on the blood in therapy. Investigations with the outcome here noted do not serve to place arsenic therapy for these cases on a more rational or stable basis. It must be remembered, however, that the process of blood-regeneration may be affected differently in health and in disease. It is quite possible that the effects of arsenic which seem to occur clinically must be sought in an influence on conditions that specially prevail in the diseased, in contrast with the healthy organism.

CHEMICAL CONSEQUENCES OF THE REMOVAL OF THE PARATHYROID GLANDS

The complete removal of the parathyroid glands is attended with fatal consequences. This experimental fact speaks decisively with regard to their importance for the maintenance of the bodily functions; it does not, by itself, give any indication of the mode in which the parathyroidal tissue determines the healthy continuance of the normal processes in the organism. As has been done in the case of other so-called glands with internal secretion, so here we may assume that they act in one of several ways—either they furnish some regulatory or stimulating product (a hormone) which is distributed to appropriate parts of the body, or they may act as antitoxic agencies, neutralizing, modifying or destroying products which would otherwise be harmful to the individual.

The most prominent symptoms of abnormality which attend the removal of the parathyroids are perhaps those of tetany. This is of itself suggestive, though by no means demonstrative, of the participation of a toxic agent in the physiologic events caused thereby. The discovery of toxic bases in large quantities in the urine of parathyroidectomized dogs by Dr. Koch[2] at the University of Michigan is therefore of more than passing interest. In every case studied methylguanidin was present in the secretion of the kidneys. When this substance was found in smaller quantities, other guanidin bases were present, so that the excreted guanidin nitrogen approached a constant. In addition to these bases others were observed, namely, beta-imidazolylethylamin, cholin, neurin and unidentified bases, although these were not distributed uniformly in the cases studied.

The histologic picture which appears in the tissues of parathyroidectomized animals is one of cellular disintegration, particularly in such organs as the liver, kidney and brain. Various degrees of chromatolysis are observed in the nuclei, and in some places the latter disappear entirely in large areas. Koch suggests that the passive protein destruction which must accompany such tissue changes may give rise to basic products and thus account for the unusual compounds excreted. Inasmuch as in animals which have been operated on the specific toxic symptoms can be provoked by the feeding of digested protein, it may be that the toxic effects are initiated by products of intestinal or even of parenteral digestion. Normally these derivatives are incorporated in some cell molecule or stored up in some form. In the case of parathyroidectomized animals after feeding digested proteins, it is suggested that the products remain free and act as toxins. In animals operated on when no feeding occurred the symptoms increased in violence with short intermissions until death. The intensity of the symptoms doubtless followed the rate of disintegration of body protein. The pathologic condition would thus appear to be a failure on the part of the cells to build up their protein. This part of the metabolism of the cell, Koch reminds us, is regarded as the function of the nucleus. Such indications, together with the formation of free "nuclein" components, point to a nuclear atrophy. The histologic findings, moreover, show an active "nuclein" degeneration. The reputed relation of the parathyroid to calcium metabolism and the theories of glandular function built up on it have not made effective progress of late. One is not justified at present in saying that these are quite unfounded. Doubtless in the complex disturbances set up by so serious an operation as the complete exclusion of vitally important glands the interrelated consequences are varied and numerous. The outcome of the discovery of the toxic bases in the urine is the suggestion of Koch that the parathyroid secretion appears to be concerned also with anabolic processes related to the synthesis of nuclear contents. Whether or not such a hypothesis can be further substantiated remains to be seen; in any event the final successful isolation of recognized toxic chemical products of traceable origin has paved the way to definite conceptions and specific lines of inquiry where hitherto the explanations have been vague and the outlook unpromising.

The Inaugural Symptoms of Gall-Stones.—The error that has found a place in the minds of all medical men, and has been faithfully carried down from one generation of text-books to another—that in the majority of cases gall-stones cause no symptoms—has been forever dispelled by the work of the surgeon. In operating in cases of advanced cholelithiasis a history of inveterate though perhaps trivial dyspepsia over a long period can almost always be obtained.—Sir Berkeley Moynihan, Address in Surgery, Brit. Med. Assn., 1913.

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[1] Saneyoshi, S.: Ueber den Wirkungsmechanismus des Arsenik bei Anämien. Ztschr. f. exper. Path. u. Therap., 1913, xiii, 40.

[2] Koch, W. F., Toxic Bases in the Urine of Parathyroidectomized dogs, Jour. Biol. Chem., 1913, xv, 43.

Current Comment

A LAYMAN'S ADVICE ON ORGANIZATION METHODS

Suggestions of value to our medical societies can often be obtained from civic organizations. In a recent issue of *Suburban Life* Mr. H. J. Howland entertainingly and instructively recites his experiences as president of the Civic Association of Montclair, N. J. "The point," Mr. Howland says, "is to begin with something definite and not too hard, something that needs not discussion but doing. If you have a civic association or improvement society [or, he might have added, a medical society] there is one thing you must avoid like the plague—the adopting of resolutions. The resolution habit is worse than drink, worse than the opium habit. In my brief and inglorious career I put many resolutions to vote, saw them adopted with enthusiasm, and then decorously interred in the archives until I shuddered at the thought that New Year's Day was *coming*. Do not pass resolutions. Get out and do things." Better advice to our medical organizations could hardly be conceived. Medical societies have from time immemorial been afflicted with the resolution habit. Simply passing resolutions never did anything. If there is something that ought to be done in city, county, state or nation, let us not pass resolutions, but if it can be done, let us go and do it.

NARCOSIS AND LACK OF OXYGEN

In a recent discussion of the nature and underlying factors of anesthesia,[1] reference was made to one of the current views, championed particularly by Verworn, which maintains that a lowered oxidative function of the tissues is responsible for the anesthetic manifestations. On this hypothesis anesthesia would practically be equivalent to a sort of asphyxiation of the cells under the influence of the narcotic. Various telling objections have been offered in criticism of this point of view. It is true that there may be an intimate relation at times between the appearance of narcosis and a tendency toward deficient oxygen-supply in the tissues; but the two factors are by no means interdependent. Narcosis cannot be explained simply on the basis of an inhibition of oxidation, inasmuch as the possibility of narcotizing an individual is not inevitably associated with the existence of oxidative changes in the organism involved. This has now been demonstrated in a convincing way in the case of animals which exist quite independent of respired oxygen, namely, the anoxybiotic intestinal parasites.[2] It is quite easy to keep the familiar intestinal roundworms, ascarides, alive and active in unoxygenated fluids, and still to narcotize them with alcohol or chloroform. They can thereupon be revived again by transfer into fresh fluid mediums without the participation of added oxygen at any time. The inhibition of oxidation in the higher forms of life must therefore at best be only an incident in the genesis of narcosis, not the fundamental determining feature.

CONCERNING "FRIEDMANN VACCINE"

We recently referred[1] to the report of Dr. Barnes of the Rhode Island State Sanatorium for Tuberculosis on his results with the Friedmann vaccine. A complete abstract of this report is given in this issue.[2] It merely adds to the mass of information that goes to make up the literature concerning Friedmann's attempt at exploiting the consumptive, all of which shows the Friedmann treatment to have no advantage over other methods of treating tuberculosis; in all probability, it is even a dangerous one. The medical profession has, until recently, maintained toward this product an attitude of reasonable scientific skepticism. In view of the fact, however, that it seems impossible to find a single reliable favorable report, the time has come for us to cease hoping that in the Friedmann vaccine we have a cure for tuberculosis. Moreover, since the methods of exploitation have become so obviously commercial, with what seems to be an utter disregard for the humanitarian viewpoint, the time surely has come for not only a definite stand against the sale of this product but for positive opposition to the methods used by those financially interested in its promotion. Friedmann secured the financial results which wide-spread newspaper exploitation brought him, and slipped away, leaving a host of "Friedmann institutes" to divide with him the dollars of the too hopeful and credulous sufferers. These "institutes" are being organized in various parts of the country and the personnel of these organizations in practically every instance is sufficient to suggest their true nature. Steps have been taken in several states to check this exploitation of the consumptive for commercial gain, especially in Idaho, Iowa and Arkansas. In others, the weakness of local ordinances has made this impossible. What is now needed is that these unscrupulous attempts should be met with an intensive campaign of education of the public concerning the dangers and worthlessness of this treatment.

THE PRESIDENT'S PROGRAM AND A DEPARTMENT OF HEALTH

President Wilson evidently believes that party platforms are made to be carried out and not merely for the purpose of winning elections. According to Washington newspaper correspondents, it is Mr. Wilson's intention to carry out the promises of the Baltimore platform during the next session of Congress. A recent dispatch from Washington in the Chicago *Tribune* says:

> "The President has insisted that during the pending special session, the Democrats revise the tariff and reform the currency. This will leave them free during the next session and the regular session a year hence to pass bills strengthening the Sherman law so as to destroy the trust evil, conserving natural resources and granting ultimate independence to the Philippines, providing employees' compensation within federal jurisdiction, creating reforms in the civil and criminal laws, limiting the amount of campaign contributions and providing publicity before elections, improving and developing the Mississippi River, and establishing a national health service."

This program includes the principal promises of the Democratic party made before the last election. The public health plank of the Baltimore platform is easily the strongest declaration on this subject which has been made by any political party:

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[1] A View of Anesthesia, editorial, The Journal A. M. A., Sept. 20, 1913, p. 968.

[2] Winterstein, H.: Kritische Uebersicht ü. die Beziehungen zwischen Narkose u. Sauerstoffatmung, Biochem. Ztschr., 1913, li, 143.

[1] The Journal, Sept. 13, 1913, p. 874.

[2] Society Proceedings, p. 1086.

> "We reaffirm our previous declaration advocating the union and strengthening of the various governmental agencies relating to pure foods, quarantine, vital statistics, and human health. Thus united and administering without partiality to or discrimination against any school of medicine or system of healing, they would constitute a single health service not subordinate to any commercial or financial interests, but devoted exclusively to the conservation of human life and efficiency. Moreover, this health service should cooperate with the health agencies of our various states and cities without interference with their prerogatives or with the freedom of individuals to employ such medical or hygienic aid as they may see fit."

This statement, which amply defines the scope and function of such a national department of health as is desirable, and yet fully safeguards the rights of each individual and satisfies the objections of any honest critic, is evidently regarded by Mr. Wilson as one of the most important planks in his party's platform. The inclusion of a national department of health in the administration program cannot fail to be gratifying to all of the advocates of better federal health organization. The discussion of this subject during the past three years has been of immense educational value. The prospects for practical, constructive legislation, providing for an enlarged health machinery as a part of our federal government, are better to-day than ever before. The duty and the opportunity of the medical profession and of medical organizations are clear. Let us be prepared unselfishly and without partisanship to give public-spirited assistance to the administration in devising plans for a national department of health that will be a safeguard to the people against disease and will command the support of all intelligent and public-spirited citizens.

THE OZONE INVESTIGATIONS

Some months ago we received an advertisement of an ozone machine from a large high-grade concern which makes such machines merely as one of the many electrical devices it puts on the market. Previous to this we had been proffered advertisements of many ozone machines as therapeutic agents. These advertisements had been refused, principally because the advertising "literature" issued by the concerns selling the machines was so extravagant and absurd that there was no doubt as to the fraudulence of the devices. The claims made for the machine first referred to, however, were not extravagant and the question then arose as to what good there was in such machines. We asked for evidence on this point, but that submitted was not satisfactory. We concluded, therefore, that it was time to investigate the matter and asked Professors Jordan and Carlson to take it up for us. This they did. When their report was in type and about to be published a report of similar work was received from Drs. Sawyer, Beckwith and Skolfield of San Francisco. It was then decided to hold back the first report so as to have the two appear together, which they do in this issue. The two groups of investigators were working independently and neither knew that the other was attacking the problem. The subject is discussed also on a preceding editorial page.

ETHICS!

"We will pay you $25 for each patient that you bring or send us." Thus, to physicians, writes the Hord Sanitarium of Shelbyville, Indiana, and continues: "We have a perfect and an absolute cure for all liquor and drug addictions." Fearing doubtless that those to whom these offers are made may be disgusted with the first proposition and will realize the evident falsity of the second, the concern encloses a list of references "showing the high moral and professional standing of our sanitarium." The Hord Sanitarium emphasizes further that it does a strictly "no cure no pay" business. Suspiciously similar is the offer made by the Mizer Sanatorium of Coshocton, Ohio, Blake V. Mizer, manager. Not many months ago Mr. Mizer was running the Hord Sanitorium (the concern's own spelling), which at that time advertised "the only guaranteed cure." Now, Mr. Mizer hurls invectives at those concerns that make "unreasonable guarantees" and adds virtuously that "we resort to no such unethical and pretended guarantee in order to do business." Nevertheless, in small type in the northwest corner of his stationery, Mr. Mizer admits that his "proposition" is no cure no pay. The fees of the Mizer Sanatorium "are $125 to $250, depending on the room." The physician's rake-off is "20 per cent. of the above." "This," explains Mr. Mizer blandly, "is simply a matter between ourselves and does not concern the patient in any way." Of course not. All the patient has to do is to pay the bills. And the Mizer Sanatorium is "conducted along ethical . . . lines"—Mr. Mizer says so. The Mizer Sanatorium has odd ideas of what constitutes ethics, medical or otherwise, for not long ago it advertised, in such medical journals as would accept its "copy," that "medical ethics prevents the statement here of the whole truth about the Mizer treatment." Of course medical ethics never prevented truthful statements of any kind. A dirty business; no other words express it. When the Hord Sanitarium and the Mizer Sanatorium claim to cure all cases of drug or liquor addiction, they make claims that are false—cruelly false. When these concerns try to drum up trade by offering secret commissions to physicians they insult an honorable profession. The fact that they send out this sort of advertising matter is presumptive proof that there are some physicians who will patronize them. Such as do so are unfair to their patients and untrue to the ideals of medicine.

HYDROCYANIC ACID FROM DECOMPOSING PROTEINS

Some new questions relative to the significance of the finding of hydrocyanic acid in animal tissues are raised by observations just published from the departments of chemistry and bacteriology at the University of Kansas. Emerson, Cady and Bailey[1] have ascertained that certain micro-organisms living on protein mediums can evolve hydrocyanic acid. Clawson and Young[2] have identified the active agent in the cases investigated as the *Bacillus*

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1. Emerson, H. W., Cady, H. P., and Bailey, E. S. H.: On the Formation of Hydrocyanic Acid from Proteins, Jour. Biol. Chem., 1913, xv, 415.

2. Clawson, B. J., and Young, C. C.: Preliminary Report on the Production of Hydrocyanic Acid by Bacteria, Jour. Biol. Chem., 1913, xv, 419.

pyocyaneus. This is, however, not the only organism found which can produce the volatile acid from proteins. The HCN-producing organisms do not liberate the poison in mediums containing free mineral acid. The facts here reported cannot fail to interest toxicologists who have scarcely been prepared to expect hydrocyanic acid as a substance liberated from decomposing proteins, though it has frequently been mentioned as a product of enzymatic reaction. The possible medicolegal bearings remain to be learned.

Medical News

ILLINOIS

Sanatorium Campaign Launched.—The Sisters of Mercy eight-day campaign for $100,000, which is to help pay for a home for girls and a sanatorium for the Home for the Aged, to be located in Aurora, was launched September 16. Already there has been $10,000 subscribed and Bishop Muldoon has promised that he would give $1,000 for every $10,000 raised by the people of Aurora and vicinity.

Personal.—Dr. Charles F. Sanborn, Chicago, has succeeded Henry L. Bailey as warden of the Cook County Hospital.——Dr. W. P. Woodard, Cherry Valley, sustained painful injuries of the wrist while leaping from a street car, September 12.——Dr. and Mrs. H. S. Worthley, Joliet, have returned from Europe.——Dr. Oscar B. Edmondson, Clinton, was operated on September 10 for appendicitis and is reported to be doing well.——Dr. Isaac Moore, Alton, suffered a cerebral hemorrhage at his home, September 9.

Chicago

Educational Campaign Against Tuberculosis.—The Chicago Tuberculosis Institute opened a two-week tuberculosis exhibit in Sherman Park, September 13. Health talks are being given each afternoon and evening to disseminate information regarding tuberculosis, its prevention and treatment.

Personal.—Dr. Clara Moore, for several years resident physician and pathologist in the North Chicago Hospital, has been appointed instructor in clinical medicine and diagnosis in the medical department of the University of Wisconsin, Madison.——Dr. and Mrs. William A. Evans left for the Northwest, September 17, on a lecture tour of Western Canada. They will return to Chicago about October 1.

MASSACHUSETTS

Floating Hospital Season Ends.—The Boston Floating Hospital has closed the busiest season on record. In the permanent wards 6,323 days' care were given to babies and 4,149 days' service to outer-deck patients. The work of the hospital on shore will be continued during the autumn and winter, as it was last year.

Personal.—The following associate medical examiners have been reappointed: Dr. John W. Pratt, Dedham, for Norfolk County; Dr. Francis E. Johnson, Erving, for Franklin County, and Dr. George A. Bancroft, Natick, for Middlesex County.——Dr. Stanton J. Ten Broeck, Orange, has been reappointed medical examiner for Franklin County.——Dr. Charles F. McCarthy, Winchester, has been appointed medical examiner of the Fourth Middlesex district.

Baby Hygiene Association Report.—George R. Bedinger, director of the Milk and Baby Hygiene Association, Boston, reported that during August 1,669 infants had been cared for by the association, an increase of 30 per cent. over August, 1912. The total of new patients cared for during the month was 317. There were forty-nine baby clinics held at the eleven milk stations of the association with a total attendance of 1,612. The association feels that funds should be raised to keep some of the stations open throughout the year.

MICHIGAN

New Hospital.—The new Manufacturers' Mutual Hospital, Detroit, was formally opened September 2. The institution has twelve beds and is provided with ample facilities for the treatment of accidents and emergencies.

Military Surgeons at County Society.—The Houghton County Medical Society at its monthly meeting September 1 had as its guests of honor the members of the Medical Corps of the Michigan National Guard on duty in the copper country. Major R. C. Apted, Grand Rapids, acting chief surgeon, read a paper on "Active Medical Service in the Field"; Major John V. Frazier, Port Huron, described the organization of the field hospital; Captain Ernest C. Lee, Detroit, spoke on the "Ambulance Company," and Captain R. J. Baskerville, Detroit, gave a detailed explanation of the use of the first-aid outfit, the general equipment, cooking of meals in the field, etc.

State Society Meeting.—The forty-eighth annual meeting of the Michigan State Medical Society was held in Flint, September 3-5. The following officers were elected: president, Dr. Guy L. Kiefer, Detroit; vice-presidents, Drs. H. E. Randell, Flint; E. C. Taylor, Jackson; E. H. Webster, Sault Ste. Marie, and R. H. Spencer, Grand Rapids; delegate to the meeting of the American Medical Association, Dr. E. T. Abrams, Dollar Bay; alternate, Dr. W. H. Hewlett, Detroit; members of the council, Dr. A. E. Bulson, Jackson, second district (reelected); Dr. R. S. Buckland, Baraga, twelfth district, succeeding Dr. A. J. Annis, Sault Ste. Marie, and secretary, Dr. F. C. Warnshuis, Grand Rapids (reelected).

NEW YORK

Tuberculosis Sanatorium Planned.—The State Department of Health has given permission for the operation of a sanatorium at Harrietstown, near Lake Placid, in the Adirondack Mountains.

Personal.—Dr. and Mrs. George F. Blauvelt, Nyack, have returned from Europe.——Dr. F. P. Hough, Binghamton, who was seriously injured in an automobile accident, September 1, is reported to be convalescent.

Medical College Will Build.—Although the Albany Medical College received only $10,000 instead of $100,000, as was expected in the will of the late Dr. John M. Bigelow, it will go on with the plans already made for the construction of the laboratory building. The Bigelow bequest provided for the establishment of the chair of laryngology and rhinology, and in addition the Bigelow stock in the college is to revert to the institution, the income to be applied for the best senior examination in diseases of the throat and nose.

Street Accidents in August.—The National Highways Protective Society in its last report shows that during the month of August there were in the state, outside of New York City, 13 persons killed and 161 injured by automobiles, 7 killed and 64 injured by trolleys, and 3 killed and 20 injured by wagons. In New York City during the month there were 47 persons killed and 204 injured in street accidents. Automobiles caused the death of 22 persons and injured 118, trolleys killed 13 and injured 53, while wagons killed 12 and injured 33. During the corresponding month last year automobiles caused 18 deaths, trolleys 13 and wagons 17.

New York City

Personal.—Dr. Francis O'Brien, ambulance surgeon of St. Mary's Hospital, Brooklyn, was seriously injured in an accident which wrecked the motor-ambulance of the hospital September 6.

Harvey Society Lectures.—The annual course of lectures under the auspices of the Harvey Society begins October 4 with a lecture by Dr. Augustus D. Waller, F. R. S., entitled "A Short Account of the Origin and Scope of Electrocardiography." Dr. Waller is a pioneer in animal electricity, was the first to record human electrocardiograms and brings with him his own apparatus, which he will demonstrate during the lecture.

To Increase County Society Membership.—The Special Committee on New Members of the Medical Society of the County of New York has sent out a letter to all members urging each to enlist at least one physician who is eligible to membership in the society. The membership at present is 2,515, and it is estimated that there are 1,500 additional physicians in the county who are eligible. While it is impossible for the committee to reach all these, it is believed that if the members take a personal interest in the matter the membership of the society can be considerably increased, even though it will lose 176 members through the formation of the Medical Society of the County of the Bronx.

The Service of Summonses by the Health Department.—Until recently summonses for the violation of the sanitary code have been served by a police officer attached to the Department of Health, but a resolution adopted by the Board of Health at its meeting on August 26 has changed this method of procedure. In order to facilitate the work of the inspector and to save him a trip to court he is permitted to serve a summons immediately without consulting a magistrate. It had also been found in the past that a number of offenders against the sanitary code disappeared while the inspector was engaged in obtaining summons. This change in procedure has been made possible by a recent amendment in the Greater New York charter.

Typhoid Outbreak on East Side.—Less than a month ago the city was congratulating itself on having the fewest number of typhoid fever cases this year that have ever been recorded, while now it is alarmed over what is probably the worst epidemic of the disease that this city has experienced in fifty years. In the affected district 178 cases of typhoid fever have been reported since the first of the month. The district lies east of Third Avenue and between Third and Thirty-Third streets. Seventy-two of the reported cases are in Bellevue Hospital. The Health Department has traced the source of the infection to one milk supply and efforts are being made to locate the dairy from which the contaminated supply has been received. The Health Department offers immunizing treatment to all the members of families in which cases have developed, but it is said that the east-siders are not eager to take advantage of this offer.

NORTH CAROLINA

Personal.—Dr. W. I. Royster, Raleigh, who was seriously injured by being struck by a passing vehicle, is convalescent and is able to attend to business.——Dr. Hubert A. Royster, Raleigh, Drs. J. P. Munroe, C. M. Strong, A. J. Crowell and C. N. Peeler, Charlotte, have returned from Europe.

Insane Hospital Report.—The quarterly report of Dr. John McCampbell, superintendent of the Western Hospital for the Insane, Morgantown, shows the present number in the institution to be 1,342, with more than 300 applications on file. The new building for women, for which $50,000 was appropriated by the last legislature, is under construction and will offer accommodation to 150 patients.

PENNSYLVANIA

Personal.—Dr. Howard H. Bell, former intern at the City Hospital, Harrisburg, has accepted the position of demonstrator of pathology at the University of Alabama, Mobile.

Philadelphia

Memorial to Dr. Steinbach.—A new building for the Young Men's Hebrew Association will be erected as a memorial to Dr. Lewis W. Steinbach. Of the $100,000 fund to be raised for this purpose, $60,000 has already been subscribed.

Personal.—Dr. Henry E. Radasch, assistant professor of histology and embryology at Jefferson Medical College, has been appointed instructor of anatomy in the Pennsylvania Academy of Fine Arts to succeed the late Dr. George B. McClellan.

English Physicians in City.—Dr. Ralph Crowley, of London, and Dr. John Sinclair, of Essex, England, were the guests of Dr. Walter S. Cornell at City Hall, Philadelphia, September 16, where they were shown the local system of school medical inspection.

Diseased Throat Conditions Among Schoolchildren.—Among the pupils of the public schools, diseased throat and nose conditions rank second in number to decayed and diseased teeth. Recommendations to parents that these conditions be corrected in their children were made in 22,946 instances by medical inspectors during the last half of the 1912 school year, making 23 per cent. of all the recommendations made by the inspectors during that period.

Hospital Report.—The annual report of the Maternity Hospital at 734 South Tenth Street, recently issued, shows that in the thirty-seven years that the hospital has been in existence 3,896 babies have been born, with a record of only 211 deaths of infants and 38 deaths of mothers. This hospital cares for the woman before the period of her confinement, through the agency of the Midnight Mission, and after the birth of the baby the mother and child are sent to the Sheltering Arms and positions are obtained through the Children's Aid Society.

WEST VIRGINIA

Personal.—Dr. Charles B. McGlumphy, Moundsville, has returned from Europe. He has been appointed professor of bacteriology in the University of Texas, Galveston.——Dr. H. L. Gray has been appointed assistant physician at the State Insane Hospital, Weston, vice Dr. J. G. Pettit, resigned.

State Tuberculosis Exhibit.—The Antituberculosis League of West Virginia is about to send a car throughout the state with a free tuberculosis exhibit. It is the intention to visit one or more places in each county where lectures will be given and moving pictures shown relative to tuberculosis. The railways of the state have given a car and free transportation over their lines.

WISCONSIN

Hospital Notes.—The Board of Health of Racine has accepted for the city the new isolation hospital just completed. The building has cost $4,100 and has accommodation for eight to ten patients.

Visiting Nurses for Tuberculosis.—The first county visiting nurse in Wisconsin to take up tuberculosis work began in Milwaukee County September 15. Additional nurses will be employed as required.

New Officers.—Second District Medical Society, tenth annual meeting at Racine, September 5: president, Dr. George H. Young, Elkhorn; secretary-treasurer, Dr. Milton V. Dewire, Sharon. It was decided to hold the 1914 meeting in Walworth County.

State Society Meeting.—The annual meeting of the Wisconsin State Medical Association will be held in Milwaukee, September 29 to October 3.——On September 30 and October 1, the Wisconsin Medical Women's Society will hold its fourth annual meeting in Milwaukee, with headquarters at the Hotel Pfister.

Personal.—Dr. Belle P. Nair, Fort Atkinson, has been appointed resident physician at the Northern Hospital for the Insane, Oshkosh.——Dr. Robert Curtis Brown has been elected chief of staff of the Milwaukee Society for the Care of the Sick.——Dr. W. C. Bennett, Oregon, has been appointed physician to the State Reformatory.

Camps for Tuberculosis.—The State Board of Control recently visited Minocqua to look over prospective sites for the new tuberculosis camps, for the maintenance of which the state has made an appropriation of $10,000 a year.——The proposed Milwaukee County Tuberculosis Sanatorium at Wauwatosa is to cost not to exceed $396,000, and not $600,000 as originally called for by the plans.——The new Outagamie County Sanatorium near Kaukauna is nearing completion. The building is 136x72 feet, is of concrete and wood construction, and will accommodate about thirty patients.——The fresh air camp established near Neenah for the summer was closed September 3.

University Establishes Bureau of Health Instruction.—The Extension Division of the University of Wisconsin has established a Bureau of Health Instruction for popular education in health and disease. According to the announcement, it is the purpose to extend this information on the part of the general public by means of lectures, publications, exhibits and correspondence. In the case of communities, surveys of existing conditions will be made, upon which working plans may be based for water system, sewage and general health regulation and administration. An exhibit is being prepared which will be sent from place to place throughout the state as opportunity and demand warrant.

GENERAL

Eye, Ear and Throat Men to Meet in Chattanooga.—The eighteenth annual meeting of the American Academy of Ophthalmology and Otolaryngology will be held in Chattanooga, Tenn., October 27-29. The address of the occasion will be presented by Colonel R. H. Elliott, I. M. S., Madras, India.

Propose Monument to Confederate Surgeon General.—At the meeting of the Association of Medical Officers of the Army and Navy of the Confederacy in 1909 it was proposed to erect a monument to the memory of Surgeon General James Preston Moore, C. S. A. This movement was indorsed by the United Confederate Veterans and by the Confederated Southern Memorial Association a year later. A monument committee has been appointed and it is proposed to erect the statue in Richmond, Va.

Meeting of Military Surgeons.—The twenty-second annual meeting of the Association of Military Surgeons of the United States was held in Denver, Colo., September 16-19, under the presidency of Surgeon William C. Braisted, U. S. N. The following officers were elected: president, Brigadier-General Charles Adams, N. G. Ill. (retired); vice-presidents, Lieut.-Colonel Jefferson R. Kean, M. C., U. S. A.; Surgeon General Rupert Blue, U. S. P. H. S., and Medical Inspector, George A. Lung, U. S. N.; secretary, Colonel Samuel C. Stanton, M. C., N. G. Ill. (reelected), and treasurer, Major Herbert A. Arnold, M. C., N. G. Pa. (reelected). The place and time for the 1914 meeting were left to the Executive Council with power to act.

Cumberland Valley Physicians Elect.—The Cumberland Valley Medical Society at its annual meeting held in Hagerstown, Md., September 4, elected the following officers: president, Dr. E. Roberts Plank, Carlisle, Pa.; vice-presidents, Drs. E. Tracy Bishop, Smithsburg, Md., E. S. Berry, Shippensburg, Pa., and John K. Gordon, Chambersburg, Pa.; secretary, Dr. John J. Coffman, Scotland, Pa. (reelected); assistant secretaries, Drs. J. Royer Laughlin, Hagerstown, Md., R. M. Shepler, Carlisle, Pa., and E. W. Palmer, Greencastle, Pa., and treasurer, Dr. H. C. Devilbiss, Chambersburg, Pa. It was decided to hold the next annual meeting in Cumberland County, Pennsylvania.

Bequests and Donations.—The following bequests and donations have recently been announced:

Seton Hospital, Spuyten Duyvil, N. Y., $15,000 by the will of Mrs. Mary H. Lawrence.

New York Orthopedic Dispensary and Hospital, $7,500 by the will of Marion DeForest Clark.

Philadelphia Orthopedic Hospital and Infirmary for Nervous Diseases, $20,000 by the will of Lucy Hunter Baird.

Presbyterian Hospital, Philadelphia, $55,000 by the will of Mrs. Jane McKee, Norris.

Worcester (Mass.) Memorial Hospital, $100,000 by the will of Mrs. Katherine Allen.

Mary Fletcher Hospital, Burlington, Vt., $25,000; Proctor Sanatorium, Pittsford, Vt., $10,000; Home for Aged Women, Burlington, Vt., $2,000; Home for Friendless Women, Burlington, Vt., $2,000; by the will of Charles B. Weatherby, Burlington, after the decease of the testator's wife and brother.

Albany Hospital, $10,000 by the will of Dr. John M. Bigelow, Albany.

The Third International Congress of Refrigeration.—The Third International Congress of Refrigeration, with an attendance of nearly two thousand delegates, over four hundred of whom were from abroad, met in Washington and Chicago, September 15 to continue until October 1. The opening meeting of the Congress was held in Washington where the delegates were welcomed by the President of the United States. After two days' sessions in that city the Congress moved to Chicago where the remaining meetings of the sessions were held. An exposition of refrigerating machinery and chilled products with methods of preserving and storing of food products was also held in connection with the Congress. In the six sections into which the Congress was divided, many papers were read relating to the chemistry and the mechanics of refrigeration. Transportation of chilled products, legislation, and allied subjects were also discussed. Among the papers of medical scientific interest read were the following: "Factors Influencing Changes in the Storage of Butter," "Bacterial and Enzymic Changes in Milk and Cream Kept at 0 C.," "Preservation of Eggs by Refrigeration," "Use of Refrigeration in the Preparation of Dried Cultures of Bacteria," "Effect of Prolonged Periods of Cold Storage on Bacteria in the Tissue of Fish," "Effect of Prolonged Cold Storage on the Chemical Composition of Fish," and "The Relation of Refrigeration to Biological Materia Medica." The chief interest of the Congress, however, was in the commercial, economic, and legal aspects of the refrigeration business and in the relation of the storage of foods to the food supply and the cost of living. Much of the time of the delegates to the convention was occupied in sightseeing and inspection of packing-houses, refrigerating and storage plants, etc.

Examination of Candidates for Assistant Surgeon.—Boards of commissioned medical officers will be convened to meet at the Bureau of Public Health Service, 3 B Street, S. E., Washington, D. C., and at the Marine Hospitals of Boston, Mass., Chicago, Ill., St. Louis, Mo., New Orleans, La., and San Francisco, Cal., on Monday, Oct. 20, 1913, at 10 o'clock a. m., for the purpose of examining candidates for admission to the grade of assistant surgeon in the Public Health Service, when applications for examination at these stations are received in the Bureau. Candidates must be between 23 and 32 years of age, graduates of a reputable medical college, and must furnish testimonials from two responsible persons as to their professional and moral character. Service in hospitals for the insane or experience in the detection of mental diseases will be considered and credit given in the examination. Candidates must have had one year's hospital experience or two years' professional work. Candidates must not be less than 5 feet 4 inches, nor more than 6 feet 2 inches, in height. The following is the usual order of the examinations: 1, physical; 2, oral; 3, written; 4, clinical. In addition to the physical examination, candidates are required to certify that they believe themselves free from any ailment that would disqualify them for service in any climate and that they will serve wherever assigned to duty. The examinations are chiefly in writing, and begin with a short autobiography of the candidate. The remainder of the written exercise consists of examination in the various branches of medicine, surgery and hygiene. The oral examination includes subjects of preliminary education, history, literature and natural sciences. The clinical examination is conducted at a hospital. The examination usually covers a period of about ten days. Successful candidates will be numbered according to their attainments on examination, and will be commissioned in the same order. They will receive early appointments. After four years' service, assistant surgeons are entitled to examination for promotion to the grade of passed assistant surgeon. Assistant surgeons receive $2,000, passed assistant surgeons $2,400, surgeons $3,000, senior surgeons $3,500 and assistant surgeon generals $4,000 a year. When quarters are not provided, commutation at the rate of $30, $40 and $50 a month, according to the grade, is allowed. All grades receive longevity pay, 10 per cent. in addition to the regular salary for every five years' service up to 40 per cent. after twenty years' service. The tenure of office is permanent. Officers travelling under orders are allowed actual expenses. For invitation to appear before the board of examiners, address "Surgeon General, Public Health Service, Washington, D. C."

CANADA

Personal.—Sir Ryckman Godlee, president of the Royal College of Surgeons of England, is expected in Toronto in November to deliver an address before the Academy of Medicine.——Dr. Harry Morrell, editor of the *Western Medical News*, Regina, has been appointed pathologist of the Regina General Hospital, with Dr. S. Rose as assistant.——Dr. Frederick Etherington, Kingston, Ontario, is one of a commission of three investigating the administration of jails in the province of Ontario.

New Officers.—The Saskatchewan Medical Society: honorary president, Dr. David Low, Regina; president, Dr. George R. Peterson, Saskatoon; secretary-treasurer, Dr. Arthur Wilson, Regina.——Prince Edward Island Medical Associataion, at Summerside: president, Dr. W. J. MacMillan, Charlottetown; secretary, Dr. J. C. Macdonald, Little York.——Aesculapian Society, Toronto: president, Dr. James M. Cotton; vice-president, Dr. Bruce L. Riordan; secretary, Dr. George Elliott; treasurer, Dr. Edmund E. King.

Hospital News.—An unknown individual has offered to build and equip a general hospital for Newcastle, N. B., at a cost of $25,000.——Regina, Sask., is erecting a new wing to its General Hospital.——An order of the Toronto Police Commissioners that all accident cases be immediately conveyed to the new Toronto General Hospital is causing considerable friction in that city.——Toronto is maintaining approximately 220 patients at regular hospital rates in the sanatoriums at Weston and Gravenhurst.

Quebec Sanitary Convention.—The fifth annual Congress of the Sanitary Services of the Province of Quebec was held in Montreal September 18 and following days. Dr. E. P. Lachapelle was the president. Dr. J. E. Laberge, M. O. H., Montreal, urged the necessity of those going to school being taught health matters. Dr. Arthur Simard of Quebec thought that 2,000 babies could be saved from death each year in that province by proper sanitary and hygienic measures. Public lectures were given by Dr. T. A. Starkey of McGill and Dr. C. N. Valin of Laval University.

Public Health in Quebec.—The Provincial Board of Health of the Province of Quebec was organized in 1881 with Dr. E. P. Lachapelle, Montreal, president, and Dr. E. Pelletier, secretary. After twenty-six years these officers still continue in their respective positions. To them is due the excellency of the public health acts of the province. In 1910 the province was divided into ten sanitary districts and six of these have been organized with medical inspectors in charge. These are required to have diplomas of public health and reside in their respective jurisdictions.

PARIS LETTER

(From Our Regular Correspondent)

Paris, Sept. 9, 1913.

Statistics of the Medical Profession

Official statistics have just been published with regard to the number of physicians, dentists, midwives and pharmacists who practice in France. The département de la Seine, which includes Paris, is at the head of the list, with 4,393 physicians, 1,125 dentists, 1,329 midwives and 1,798 pharmacists. The département du Nord comes next with 811 physicians, 97 dentists, 422 midwives and 523 pharmacists. The lower places in this statistical list are held by the départements des Hautes-Alpes, Haut-Rhin and la Lozère. In the Hautes-Alpes there are only 29 physicians, 2 dentists, 33 midwives and 14 pharmacists. Altogether, in France there are 20,809 physicians (making an average of one physician for 2,000 persons), 2,848 dentists, 13,066 midwives and 11,585 pharmacists.

A Monument to Dr. Henry Cazalis

On September 7, in the little cemetery of Ferney, near Geneva, but on French soil, a monument was erected to Dr. Henry Cazalis, known in literature under the pseudonym of Jean Lahor. He was born in 1840 and died in 1909 in Switzerland; but as he wished his remains to rest on French soil, the cemetery of Ferney, the little village where Voltaire once lived, was chosen. Jean Lahor wrote several volumes of poetry, but in the last years of his life the spirit of apostleship awoke within him and he dreamed of a society reinvigorated by social hygiene and popular sense of beauty. Abandoning poetry, he wrote works on science and marriage, cheap foods, cheap dwellings, etc. He also contributed to the popularization among us of the esthetic ideas of the English poet, William Morris.

BERLIN LETTER

(From Our Regular Correspondent)

Berlin, Sept. 5, 1913.

Personal

K. Buerkner, professor of otology in Göttingen, died on a vacation trip in the Tyrol, September 2, aged 60. He began as privat-docent and director of a policlinic for ear diseases in Göttingen in 1877. In 1885 he was appointed professor extraordinary. His most important works are the "Text-book of Otology" and an atlas of pictures of the membrana tympani. He also assisted in the preparation of a number of compilations and was an associate editor of the *Archiv für Ohrenheilkunde*.

Geheimrat von Baelz died September 1, after a long sickness at Stuttgart, at the age of 64. After having been assistant to the renowned Professor Wunderlich of Leipsic in 1871 and 1872, he accepted in 1875 a call to the Japan Medical School at Tokio, where he first taught physiology and afterward occupied the chair of medicine and gynecology. At the same time he was body surgeon of the crown prince, the present mikado. With reference to the illness of the latter, with which the press was full a few weeks ago, he published an account in the *Deutsche medizinische Wochenschrift* of the illness for which he had treated the Japanese ruler in his time, but with some reservation on account of his previous confidential relation. I can disclose that in his youth the mikado was treated by Baelz for a peculiar form of pulmonary tuberculosis, which later healed completely.

After nearly thirty years of activity in Japan (he married a Japanese lady there), Baelz returned to his home in Stuttgart and devoted most of his time to scientific employment. In 1908 on the invitation of the imperial family he visited Japan for a time. In addition to a long treatise on the side effects of salicylic acid, he prepared a text-book on internal medicine, especially for his classes, and devoted much attention to anthropologic and pathologic conditions and published some very interesting articles on these subjects.

Postgraduate Courses on Social Medicine

By decree of the minister of the interior the provincial presidents throughout Prussia are required to establish medical postgraduate courses in social medicine in their respective provinces. The participants in these courses are then expected on their part to give lectures and exercises in the societies for their neighboring colleagues. The courses will be given financial aid by the government provided that the medical chambers *(Aerztekammer)* interested will appropriate additional funds. As an introduction to these courses, a twelve-day course will be held in Berlin this autumn for those physicians who are to deliver the lectures in the provincial courses.

Hamburg to Loan Radium and Mesothorium to Physicians

A bureau for the distribution of radium and mesothorium has been founded in the Hamburg institute for cancer and tuberculosis research which was founded a short time ago. The object is to secure as large a quantity of these preparations as possible in a short time and place them at the disposal of the public. At present about 150 mg. of radium bromid are on hand; this quantity is to be doubled in about two weeks and there is a prospect of securing further amounts. The preparations are to be loaned to physicians.

Diphtheria in Prussia, 1902 to 1911

The morbidity from diphtheria in Prussia increased from 54,848 in 1905 to 83,821 in 1910, and in Berlin from 1,485 in 1902 to 6,061 in 1910. The number of deaths from diphtheria in Prussia decreased from 14,175 in 1902 to 9,683 in 1910, but in Berlin they increased from 239 in 1902 to 695 in 1910. Calculated for 10,000 living, the relative number of cases in Prussia increased from 15.41 in 1902 to 20.87 in 1910, and that in Berlin from 7.68 in 1902 to 28.58 in 1910. The relative number of deaths in Prussia fell from 4.05 in 1902 to 2.45 in 1910, while in Berlin in the same time it rose from 1.25 to 3.11.

Marriages

Janvier Whitton Lindsay, M.D., Washington, D. C, to Miss Catherine Armyn Crabill, of San Antonio, Mo., July 10.

Nathan B. Eddy, M.D., to Miss Wilhemina E. Ehrens, both of New York City, at Glens Falls, N. Y., September 7.

Albert West Metcalfe, M.D., Mobile, Ala., to Miss Anne Porter Kolb of Birmingham, Ala., September 10.

Lewis Booker, M.D., New Castle, Del., to Miss Kathleen M. Flannagan of Charlottesville, Va., September 3.

Charles P. McKee, Jr., M.D., to Miss Pearl Catherine Losher, both of St. Marys, Ohio, September 4.

Albert Butler Stone, M D., Lamar, Mo., to Miss Bessie Wood Ross of Pilot Grove, Mo., August 21.

Walter E. Caswell, M.D., Brockton, Mass., to Miss Annie S. Cameron, of Halifax, N. S., September 2.

Elmer W. Mosely, M.D., Lincoln, Neb., to Miss Etta Frances Brothers of Chicago, September 3.

Charles Arthur Boyd, M.D., Belpre, Kan., to Miss Cora Belle Klein of Iola, Kan., September 10.

Charles H. Shroder, M.D., Duluth, Minn., to Miss Helen Blau of Covington, Ky., August 23.

Russell V. Thomas, M.D., Manteno, Ill., to Miss Cora Lambird of Newton, Ill., September 10.

Albert K. Detwiller, M.D., to Miss Margaret O'Dowd, both of New York City, September 6.

R. L. Carr, M.D., Greenville, N. C., to Miss Elizabeth Pugh of Arkansas, Ark., September 3.

Sydney Walker, Jr., M.D., to Miss Isabelle Clarke Irwin, both of Chicago, September 16.

Walter T. Bronson, M.D., to Miss Laura May Graham, both of Pueblo, Colo., September 2.

Deaths

Edwin Wilcox Bartlett, M.D. University of Vermont, Burlington, 1866; a fellow of the American Medical Association; for forty-three years a specialist in diseases of the eye and ear, of Milwaukee, and for thirty-eight years local surgeon for the Chicago, Milwaukee and St. Paul Railway; emeritus professor of ophthalmology and otology in the medical department of Marquette University; from 1886 to 1889 a member of the school board and from 1894 to 1900 a trustee of the Milwaukee Public Museum, for four years serving as president of the board; died at his home in Milwaukee, September 11, aged 74.

James Milton Blaine, M.D. Jefferson Medical College, 1881; a member and once secretary of the Colorado State Medical Society; secretary of the Dermatological Section of the American Medical Association in 1899; professor of dermatology and venereal diseases in the Denver and Gross College of Medicine; dermatologist at St. Anthony's and the Denver County Hospital, Mercy Sanatorium and the Jewish National Hospital for Consumptives; editor of *Colorado Medicine;* died at the home of his daughter in Carnegie, Pa., September 7, from cerebral hemorrhage, aged 58.

Richard Van Santvoord, M.D. Bellevue Hospital Medical College, 1875; of New York City; a fellow of the American Medical Association, the American Academy of Medicine and The Harvey Society; visiting physician to the Harlem Hospital; died in the Presbyterian Hospital, New York City, September 10, two days after a surgical operation, aged 60.

Walter Millard Fleming, M.D. Albany (N. Y.) Medical College, 1862; a specialist in nervous maladies and insanity, of New York City, for forty years; once health officer of Rochester, N. Y.; surgeon of the Thirteenth New York Volunteer Infantry and later of the Third Brigade, N. G., N. Y., during the Civil War; one of the founders of the Order of Nobles of the Mystic Shrine; died at the home of his son in Mount Vernon, N. Y., September 9, aged 75.

George C. Laws, M.D. University of Pennsylvania, Philadelphia, 1871; a member of the Medical Society of the State of New Jersey; one of the promoters of the Paulsboro (N. J.) National Bank; died at the home of his son in Philadelphia, September 5, aged 68.

Benjamin Franklin Severs, M.D. Long Island College Hospital, Brooklyn, N. Y., 1888; a member of the Medical Society of the State of Pennsylvania; for two terms a member of the Philadelphia School Board; died at his home in Philadelphia, September 5, aged 57.

Augustus Christian Hetrick, M.D. Eclectic Medical Institute, Cincinnati, 1858; president of the Wellsville (Pa.) National Bank and for more than half a century a practitioner of York County, Pa.; died at his home, September 4, from acute gastritis, aged 78.

Mortimer M. Taplin, M.D. McGill University, Montreal, 1892; a fellow of the American Medical Association and a member of the Rochester (N. Y.) Pathological Society; died in the Rochester General Hospital, September 9, from pneumonia, aged 45.

James Franklin Eddington, M.D. Louisville (Ky.) Medical College, 1878; a member of the Illinois State Medical Society and local surgeon at Enfield for the Louisville and Nashville Railroad; died at his home, September 1, from heart disease.

Charles Joseph McFadden, M.D. University of Pennsylvania, Philadelphia, 1891; a member of the Medical Society of the State of Pennsylvania; died at his home in Pittston, September 3, after an illness of two years, aged 44.

William Van Buren Ezell, M.D. University of Louisville, Ky., 1872; for more than forty years a practitioner of Brazoria County, Tex.; died at his home in Angleton, August 26, from nephritis, aged 62.

J. Waller Ford, M.D. Medical College of Virginia, Richmond, 1876; of Hinton, W. Va.; while watering his horse at Talcott, W. Va., September 4, was kicked in the forehead and died two hours later, aged 57.

John E. Gruber, M.D. Medical College of Fort Wayne, Ind., 1882; for more than thirty years a resident of Isabella Co., Mich.; died at his home in Shepherd, August 31, from cerebral hemorrhage.

Reuben B. Keeran, M.D. Eclectic Medical Institute, Cincinnati, 1879; for twenty-seven years a practitioner of Hancock County, O.; died at his home in Findlay, September 5, from asthma, aged 60.

James Augustus Coyne, M.D. Jefferson Medical College, 1896; of Newark, N. J.; died at his summer home in Sterling, Mass., September 8, from heart disease, aged 60.

Owen A. Palmer, M.D. Hahnemann Medical College, Chicago, 1884; formerly of Warren and Cleveland, Ohio; died at his home in Akron, Ohio, August 21, aged 65.

Edward Worcester, M.D. New York University, New York City, 1851; for 53 years a practitioner of Waltham, Mass.; died in his home, September 2, aged 83.

Charles Hamilton Ballantine, M.D. Jefferson Medical College, 1882; of Philadelphia; died in the Jefferson Hospital in that city September 8, from dropsy, aged 56.

E. H. Fordtran, M.D. Fort Worth (Tex.) University, 1911; formerly of Fayetteville, Tex.; died in San Angelo, Tex., September 3, from tuberculosis, aged 25.

John Russell Morris (license, Nebraska, 1909); a resident of Richardson County, Nebraska, since 1878; died at his home in Humboldt, September 2, aged 63.

Mott J. Gillam, M.D. Bennett Medical College, Chicago, 1886; died at his home in Florence, Kan., July 2, from cerebral hemorrhage, aged 48.

Thomas H. Frey, M.D. Memphis Hospital Medical College, 1899; died at his home in Beaumont, Tex., September 6, from nephritis, aged 48.

Lewis G. Tandy, M.D. Washington University, St. Louis, 1886; died at his home in St. Louis, August 28, from meningitis, aged 51.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

SINKINA

Report of the Council on Pharmacy and Chemistry

Sinkina is a malaria "cure" put on the market by the Metropolitan Pharmacal Company, New York. The product was presented to the Council on Pharmacy and Chemistry for admission to New and Nonofficial Remedies and was rejected because insufficient evidence was submitted to substantiate the improbable claims made for it. The manufacturers were sent a copy of the report stating that their product was refused recognition. In view of the advertising that was persisted in after its rejection, the Council's referee for Sinkina submitted the preparation to clinical tests. Both the original report and the results of the clinical tests are given in the following report, which was submitted to the Council and recommended for publication. The complete report having been sent to the manufacturers and their reply considered, the Council authorizes its publication. W. A. PUCKNER, Secretary.

THE COUNCIL'S FIRST REPORT

The Council, after investigating the claims made for Sinkina, declared the product unworthy of recognition and adopted the following report, which was sent to the manufacturers:

> No experimental evidence regarding the therapeutic value has been submitted. The clinical evidence is scant and not of such character as to deserve much consideration, no sufficient precautions having been adopted to avoid wrong conclusions. Judging from the evidence at hand the preparation is simply a dilute sugar-alcohol-water solution containing a little oil of cumin—Roman caraway. It is highly improbable that such a liquid would have the therapeutic effects claimed for it by the Metropolitan Pharmacal Company. In view of the improbable claims made for Sinkina, and the failure to substantiate them by suitable evidence, it is recommended that the preparation be refused recognition without at this time considering the claims made in regard to the identity and amount of the drug claimed to be the essential constituent.

In spite of its rejection Sinkina was persistently advertised. It was thought advisable, therefore, to submit the preparation to clinical tests. This was done and the results are given in the following report:

THE CLINICAL REPORT

The following quotations indicate the claims made for this preparation:

> "In malarial conditions there is nothing that acts so promptly and efficaciously as Sinkina. Sinkina destroys radically every trace of the parasite in the blood from the time of its first appearance, builds up the damaged corpuscles, revitalizes the system, and completely eliminates every trace of the disease. Sinkina is deservedly termed the *Specific* for Malaria."

These claims were supported by testimonials which usually gave no indication of a demonstration of the presence or absence of malarial plasmodia in the blood. The following is an example showing the character of most of the evidence presented by the manufacturers:

> "Three weeks ago I prescribed Sinkina for a negro man 40 years of age suffering from a double tertian malarial infection having a chill every afternoon for four consecutive days. He came to my office about 8 a. m. and was due to have a chill about 6 p. m. I gave him the sample of Sinkina and directed him to take a tablespoonful at once also at noon and again at 4 p. m., and to continue taking it in same size dose three times a day till he had taken it all. He reported to me in a week from that date and told me he was feeling fine and that he hadn't had any more chills. The patient up to this time is apparently cured."

As the claims were supported by a few testimonials purporting to be based on exact investigations, the Council submitted the preparation to careful laboratory and clinical tests. For this investigation the Council was fortunate in securing the help of physicians actively engaged in the study of malaria.

Experiments were made *in vitro* with the preparation; 1 ounce of Sinkina was used, and its action was compared with that of 10 grains of quinin sulphate. When these were added to cultures of malarial plasmodia in proportion corresponding to 1 ounce of Sinkina or 10 grains of quinin sulphate for a 150-pound man, the quinin was found to be unfailingly antagonistic to the malarial organism, the drug prevented the segmentation of the organism and finally killed it in about thirty-six hours. The Sinkina did not kill the parasite after seventy-two hours of continued action, and the parasites segmented in the presence of it just as actively as they did in the control.

The investigator was furnished with two sets of preparations in plain prescription bottles so as to avoid all influence of the personal equation. One set consisted of Sinkina, the other of a mixture of alcohol, sugar and water with some oil of cumin. The investigator reported that, so far as the tests on the cultures of malarial plasmodia were concerned, he could not determine any difference in the results obtained with the oil of cumin preparation, made in the laboratory of the Association, and those obtained with the Sinkina of the Metropolitan Pharmacal Company. Clinical trials were made by three independent investigators. Two of them received the two sets of preparations described.

FIRST INVESTIGATION

The first investigator treated two cases with Sinkina: one was of the ordinary estivo-autumnal type and the other an ordinary tertian.

Cases 1 and 2.—A good many schizonts were present in the blood of each patient forty-eight hours after the administration of Sinkina. In the instance of the case of tertian the patient had his chill forty-eight hours after the medicine had been started. As the Sinkina failed to produce any effect the patients were then put on quinin to stop the disease.

Case 3.—The patient had taken 10 grains of quinin on the day on which the experiment was begun. He had the tertian form of the disease, and plasmodia were quite numerous at the beginning. The quinin was discontinued and Sinkina was given in doses of 1 ounce three times a day. The day following the administration of 10 grains of quinin and 1 ounce of Sinkina, no parasites could be found in the blood. The Sinkina was continued in the doses mentioned. On the seventh day the patient had another chill, and a great many parasites were found in his blood. The Sinkina was discontinued and the patient was at once relieved by quinin.

This investigator gives it as his opinion, based on these observations, that the preparation (Sinkina) is absolutely worthless in the treatment of malaria, and he does not think it necessary to make any further experiments with it.

SECOND INVESTIGATION

The second investigator treated two cases of tertian malarial fever with these preparations until it was satisfactorily proved that the drug was having no effect on the presence of the parasites in the blood, when he began the administration of quinin.

Case 4.—After the use of the remedies for one week the investigator still found young rings half-grown and gametes present in the blood. Apparently there was a relative increase in the number of parasites. He then began the administration of quinin. Blood-smears taken the next day after 40 grains of quinin had been taken showed one parasite after eighteen minutes' search of one slide, and two after thirty minutes' search of a second slide. At the end of a week's treatment the patient was discharged recovered. The blood examination of two slides was negative.

Case 5.—This was a case of tertian malaria. After treatment for five days with Sinkina the blood still showed tertian parasites with increase in the size of the spleen, and the preparation was without effect on the clinical course of the disease. Quinin was then begun, and the blood examination became negative at the end of three days.

The investigator concludes that the preparations furnished him were absolutely worthless in the treatment of two cases of the tertian form of malarial fever, and that these solutions had no effect on the presence of the parasites in the peripheral circulation. In a case of quartan malaria, both of the preparations (cumin oil mixture and Sinkina), sent by the Association Laboratory, were without effect on the plasmodia in the blood. This investigator employed the solution made by the Association Laboratory (cumin oil mixture) as well as Sinkina, and was unable to note any differences between them.

THIRD INVESTIGATION

The third investigator began the trial of Sinkina at the instance of the manufacturers, and used it in three cases, two of them being benign tertian malaria and one case of mixed infection (benign tertian and estivo-autumnal).

Case 6.—This was one of the cases of benign tertian malaria. The patient gave a clinical history of malaria with chills occurring on alternate days for a little over a week. There was an immediate cessation of all clinical symptoms, and three days after the patient had been on ½ ounce of Sinkina three times daily there was no evidence of any plasmodia in his blood; his additional treatment consisted of 5 grains of calomel the evening of the first day with a saline the next morning. Before the patient was put on treatment, numerous parasites of both the asexual and sexual forms were observed. The patient remained in bed for a few days, and then returned to work. A week later he was again taken ill with a return of all of his previous clinical symptoms.

Case 7.—This case was one of mixed infection (benign tertian and estivo-autumnal). The patient had a clinical history of malaria dating back two weeks, with a maximum temperature of 104 on admission. Tertian rings, estivo-autumnal rings and crescents were found in the blood. The patient was placed in bed, given thorough eliminating treatment, and ½ ounce of Sinkina was administered four times daily. His clinical symptoms ran on for two days with no change, and there was no difficulty in finding the plasmodia in blood-smears, which were taken twice daily. The dose was then doubled and at the end of four days more there was no change in either his clinical symptoms or the blood-findings. The patient was then placed on 10 grains of quinin sulphate with 15 drops of diluted hydrochloric acid three times daily, to which he responded in less than forty-eight hours and made an uneventful recovery.

Case 8.—This was the other case of benign tertian malaria. The patient had chills every other day while on the treatment, and laboratory diagnosis confirmed the clinical findings. Experimental treatment was carried on for four days, with a negative result.

The investigator calls attention to the fact that the first case in which improvement resulted does not show any necessary connection with the Sinkina administered, for many cases of benign tertian will clear up in just as short a time under any line of treatment, while practically all will eventually do so. This investigator later reported another case and transmitted a clinical chart.

Case 9.—This patient was admitted to the hospital, Dec. 30, 1912, with a history of having had malaria for some weeks. The diagnosis was confirmed by a blood examination. He was then carried for four days without treatment other than rest in bed and a liquid diet. His symptoms subsided by the third day. On the fourth day a count of the parasites was made which showed that there were 1,160 asexual parasites and 260 sexual forms to every thousand leukocytes. The following day he was placed on Sinkina, 1 ounce three times daily. There was exacerbation of symptoms on the following day, which gradually increased until the fourth day, remaining about stationary for a day or so. The fifth day after the patient had been placed on Sinkina, another count of the parasites showed 5,600 asexual parasites and 300 sexual forms to the thousand leukocytes, this being an increase of 4,440 asexual forms and forty sexual forms to every thousand leukocytes. With the second count of parasites the dose of Sinkina was increased to 2 ounces every four hours, the patient being kept on this until January 14, without result. He was then placed on quinin, with a complete reduction of the temperature to normal and the disappearance of the parasites from the blood.

The investigator also reported a case of benign tertian malaria.

Case 10.—This was in a child of 8 years which was treated by the investigator's confrère and gave similar negative results. Blood examination showed numerous parasites. The child was placed on 1 ounce of Sinkina three times a day and kept on it for two weeks. The clinical picture remained unaltered, and parasites could be detected in numbers whenever examinations were conducted. A gradually increasing enlargement of the spleen was also noted. At the end of two weeks quinin was substituted, and the child went on to a rapid and uneventful recovery.

This investigator also concludes that the claim put forth by the Metropolitan Pharmacal Company that Sinkina is a specific in the treatment of the malarial fevers is entirely without foundation, and that the firm will be unable to demonstrate to the contrary.

These investigations demonstrate that Sinkina is not a specific against malaria, and that it has no more effect than a mixture of oil of cumin, sugar, alcohol and water. They further show the fallacy, first, of concluding from a temporary cessation of the symptoms in malaria that the disease has been cured and, second, of ascribing such temporary improvement to the influence of a remedy which has no known effect on the malarial organism.

Correspondence

Creeping Eruption

To the Editor:—I have noted the publication of reports of two cases of creeping eruption (The Journal, July 26, 1913, p. 247), by Dr. Gustave L. Rudell, in one of which, in August, 1912, he was able to recover the larva. In view of the fact, as stated therein, that recovery of the parasite producing this lesion is exceedingly rare, only two investigators having previously reported finding it, it might be of interest to report that in August, 1910, I succeeded in recovering two of these organisms from such a case while in hospital work in Philadelphia. I had not reported the case prior to this writing, since that part of the limited literature on the subject which had come under my observation had not before impressed me with the fact that the demonstration of this organism in connection with these cases was of such rare occurrence as is apparently true.

My notes show that both parasites found by me were practically the same as to shape, size and body markings as a specimen represented in a drawing after Sokolow, in Pusey's text-book—which was reproduced in The Journal of July 26—with the single exception that ring markings of the body in these specimens were not fully visible except near the head; there was a general motility of the body of a slight degree. The two larvae in question were recovered from the right forearm as small black dots, barely visible to the naked eye, and embedded in the cuticle at points of intense itching.

In this case it was notable that there was practically no difficulty encountered in finding and extracting the larvae, which were picked from the skin along with small scale-like particles of cuticle by the crude method of using the nails of thumb and forefinger, and in these two instances the small mass thus obtained was placed on a slide moistened with water for microscopic examination; patient himself in my presence later picked a third one from this forearm which was not examined microscopically. It was likewise worthy of note that there was no eruption of a distinctly "creeping" nature in this case, but at each of the three isolated points of itching, which alone drew patient's attention to the condition, there was a small erythematous area (no doubt intensified by scratching the parts) in the center of which was a slight scaly puckering of the epidermis containing the black dot.

Patient stated that he had been conscious of itching for only a few hours before I saw him and later informed me that he was aware of no further symptom of this kind after removal of the larvae. I might further add that he had just previously spent several days at the seashore, frequently in surf-bathing, at which time the larvae were probably deposited on his forearm.

Thomas H. Cates, M.D., Little Rock, Ark.

Lactobacilline—A Reply

To the Editor:—May we call your attention to what is doubtless an unintentional injustice done our product, Lactobacilline Liquide, in the Queries and Minor Notes Department of The Journal, Aug. 23, 1913, p. 618? In your note you refer to an article by Professor Heinemann, dated Jan. 30, 1909, stating that yeasts were found in the product of the Franco-American Ferment Company as sold in the form of powder and tablets and that "Sewerin also failed to find *B. bulgaricus* in Lactobacilline."

The Lactobacilline preparations examined by Professor Heinemann were imported and were foreign products obtained previous to the time when the Ferment Company of New York manufactured Lactobacilline. The Lactobacilline referred to by Sewerin was examined by him in Russia and was not manufactured in America. His report was published in the *Centralblatt für Bakteriologie*, November, 1908, and was merely referred to in The Journal, Jan. 27, 1912. Evidently, therefore, the criticisms of Heinemann and Sewerin do not apply to the Lactobacilline products which we sell.

As to the query propounded by your correspondent regarding Professor Metchnikoff's supervision of the Franco-American Ferment Company's preparations, we wish to give the following information: Once a month samples of all Lactobacilline products made in this country are bought at random in the open market by an independent law firm which acts as attorney for Professor Metchnikoff and La Societé Le Ferment. These are sent to Paris for examination. If they are not found to conform to Professor Metchnikoff's scientific requirements, *ipso facto*, we lose the right to use his name in connection with the products.

When under the authorization of Professor Metchnikoff we first put the Lactobacilline products on the American market, the therapeutic efficiency of the *Bacillus bulgaricus* in the various forms of auto-intoxication was but little known to the profession and we felt compelled to enclose printed matter in our packages. This, we were led to believe, made our products unacceptable to the Council on Pharmacy and Chemistry under its rules. It was for this reason solely that the Lactobacilline products have not heretofore been submitted to the Council and we wish to take this opportunity of stating that steps have been taken to submit these products to the Council on Pharmacy and Chemistry in the belief that they will be found acceptable for inclusion in New and Nonofficial Remedies.

The Franco-American Ferment Co.,
by Joseph C. Richard, Vice-President.

Queries and Minor Notes

Anonymous Communications and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

STATES IN WHICH GOVERNMENT PHYSICIANS MAY REGISTER WITHOUT EXAMINATION

To the Editor:—In what states, if any, are medical officers of the United States Army, Navy and Public Health Service (on the active list, retired or resigned) allowed to register, without taking the regular state board examination? Please omit my name in answering.

E. M. D.

Answer.—The following states have taken legislative action in this regard:

1. Alabama grants a certificate to practice to any such officer on the active list, provided he can produce evidence as to his still being in the service.
2. California allows the medical officers of the Army and Navy, whether on the active list, retired or resigned, to practice in that state on a proper showing that they are or were duly commissioned, and on paying a fee of $50.
3. Illinois permits the State Board of Health to use its discretion in issuing licenses without requiring an examination to any physician who is a graduate of a medical college and who

has passed an examination before the United States Army, Navy or Public Health Service.

4. North Dakota allows the experience which any one has gained in the Army, Navy or Public Health Service to be given due consideration. The board may in its discretion license such officers without an examination on paying a fee of $25 and producing proper credentials as to their service, etc.

5. Texas permits surgeons and such officers of the United States Army, Navy or Public Health Service to engage in private practice if a license to do so is first obtained from the board.

The majority of states, it would seem, permit such officers to practice only in the line of their official duties. In a few states the language of the statutes might be construed to imply that government medical officers may practice without being first licensed. An example of this is Iowa. Its statute says that the act is not to apply to surgeons of the United State Army, Navy and Public Health Service. It does not say that this is simply in the line of their official duties. It may therefore be inferred that such officers may practice privately. Kentucky, Louisiana, Maryland, Tennessee and Wisconsin have similar language in their laws. The New York statute exempts such officers "while so commissioned." This would seem to imply that such officers may practice privately while still commissioned.

WEICHARDTS' ANTIKENATOXIN — BAUME ANALGESIQUE BENGUE

To the Editor:—1. What is Weichardts' Antikenatoxin? A paper was read on the use of this substance at the recent congress in Buffalo.

2. What is the composition of Baume Analgesique Bengue? Is there any official preparation of similar constituents?

S. T. A., New York.

ANSWER.—1. We have no information in regard to Weichardts' Antikenatoxin.

2. Analyzed by the British Medical Association this "patent-medicine"-"ethical-proprietary" was found to have the following composition (THE JOURNAL A. M. A., Dec. 14, 1912, p. 2173):

Menthol	18 per cent.
Methyl salicylate	20 per cent.
Lanolin, anhydrous	54 per cent.
A fat, apparently lard	8 per cent.

No similar preparation is described in the United States Pharmacopeia or in the National Formulary, but the British Pharmaceutical Codex, gives tne following:

Unguentum methylis salicylatis compositum B.P.C.

Methyl salicylate, by weight	50.00	(10 ounces)
Menthol	10.00	(2 ounces)
Eucalyptol, by weight	2.50	(¼ ounce)
Oil of cajuput, by weight	2.50	(¼ ounce)
White beeswax	17.50	(3¾ ounces)
Hydrous wool-fat	17.50	(3¾ ounces)

Mix the wool-fat with the melted beeswax, gradually incorporate the menthol and liquids, previously mixed by trituration, and stir until cold.

SEASHORE SANATORIUM

A correspondent asks us for the address of "one or more sanatoriums located at or near the seashore, either on the Eastern or Southern coast." We shall be glad to receive information for our correspondent regarding such sanatoriums.

OXYOLINE AND OZONE MACHINES

To the Editor:—What about the Oxyoline (ozone) machine that a number of our doctors are using? I had always supposed that it was a fad on a par with the nebulizer and other such stuff that we have seen come and go. Lots of it is now piled up in physicians' offices all over the country. An agent for the Oxyoline outfit was here yesterday to see me, however (and I don't mind telling you that he is about as smooth an article as ever "came down the pike"), and showed me letters from some of our best men (some of them members of our state society and of the American Medical Association), who make some very big statements in regard to the curative properties of ozone. If there has been anything published in regard to these people in THE JOURNAL, please tell me where to find it. Also anything that you know about this outfit. On its face this proposition doesn't look good. Any advice will be appreciated.

F. P. STEVENSON, M.D., Aurora, Mo.

ANSWER.—The subject of ozone machines is dealt with both in the editorial and in the original article departments of this issue. The "Oxyoline" machine was discussed in THE JOURNAL, Nov. 11, 1911, page 1629. The concern which exploits it has made claims that are not only unscientific but absolutely fraudulent. The apparatus itself is being used in various places as an accessory to quackery. The main points emphasized by the manufacturers of the Oxyoline machine are not those of therapeutic efficiency of the device, but the money-making possibilities in it.

Medical Economics

THIS DEPARTMENT EMBODIES THE SUBJECTS OF POSTGRADUATE WORK, CONTRACT PRACTICE, LEGISLATION, MEDICAL DEFENSE, AND OTHER MEDICOLEGAL AND ECONOMIC QUESTIONS OF INTEREST TO PHYSICIANS

PRACTICAL NEWSPAPER COOPERATION

The value of intelligent cooperation on the part of the newspapers in saving life is well shown by a letter and two editorials, recently received from Mr. William L. Geppert, editor of the *Daily Telegram*, of Clarksburg, W. Va. Mr. Geppert, as a public-spirited newspaper man, was impressed with the need of wide-spread publicity of editorials in recent issues of THE JOURNAL on "Suicide with Bichlorid of Mercury." These editorials, distributed by the Association Press Bureau to the newspapers, have been widely copied. Mr. Geppert, however, not only reprinted the editorials, for the information of his readers, but also suggested a practical way in which the newspapers can cooperate, that is, by making it an inflexible rule to omit from newspapers all mention of the means by which self-destruction was accomplished. Mr. Geppert's editorials are worthy of reproduction, as an illustration of the value of newspapers in the campaign for better health conditions.

The first editorial was entitled:

"PROMOTING DEATH

"For the sake of despondent and melancholic humanity, the *Telegram* desires to 'call down' a newspaper correspondent of Fairmont for telegraphing to various newspapers the kind of poison that was swallowed by a child there a day or two ago by mistake and that resulted in the child's death; and also the name of the poison taken by a man there last evening with suicidal intent. The *Telegram* also desires to condemn the Wheeling newspapers that chronicled the names of the poisons in headlines over the same items, and other newspapers that published the items without eliminating the name of the poison. And, further, the *Telegram* desires to lay down a rule to be followed by newspapers in publishing news items of suicides, accidental deaths and other like tragedies caused by poisons, namely, to eliminate the name of the poison.

"Not so very long ago, as will be readily recalled, a Georgia banker died of a poison taken in mistake; and the name and the nature of the poison were heralded from one end of the land to the other with what was declared to be not altogether an accurate account of its effects. Immediately thereafter a wide-spread series of suicides from this same poison occurred throughout the country; and cause and effect were so obvious as to lead THE JOURNAL of the American Medical Association to enter a vigorous protest against the publication of such cases altogether.

"While it is probably too soon to expect any notable decrease in the endless publication of ordinary crimes and tragedies with which newspapers are half filled nowadays to no good purpose, it is not too soon to begin a campaign against the unwitting advertisement of poisoning methods—against a promotion of death and destruction that would scare the consciences of many persons when brought to realize its actual significance. Accounts of suicides, especially, should be so judiciously edited as to offset the direful effects resulting through mental suggestion on weak, ignorant, despondent and afflicted persons.

"In regard to the poisoning cases at Fairmont, commendation is due the Associated Press for flatly refusing to carry the names of the poisons in its stories of the fatalities."

In the second editorial, the editor makes an exception to his own rule, for very good reasons. He says, under the heading:

"AN AGONIZING DEATH

"It is a rule of the *Telegram*, as well as other respectable journals and great news-dispensing association like the Associated Press, to refrain from publishing the name of a poison in connection with reports of suicides and it regards a violation of the rule as reprehensible journalism. It is unnecessary to repeat in detail the *Telegram's* reason for this, as it is perfectly obvious what effect such suggestion can have and daily does have on the minds of melancholic persons.

"In an earnest desire, however, to do what it can to offset the recent blunders of many newspapers in advertising a certain poison for suicide, or, in other words, promoting self-destruction, the rule will be here overstepped, but in a general way. A mistaken belief prevails that poisoning by bichlorid of mercury is an easy means of taking oneself off. The contrary, however, is the case as the poison is deadly, insidious, productive of great suffering, and so slow-working that the agonies of death are long drawn out. As a means of death bichlorid of mercury is the worst that can be used. Let The Journal of the American Medical Association affirm this in more authoritative words."

The rest of the editorial consists of a quotation from the editorial in The Journal.

SURGICAL INSTRUMENTS UNDER THE TARIFF BILL

In The Journal for May 3, 1913, p. 1382, the tariff rates on surgical instruments and the like under the present law were compared with the rates in H. R. 3321, as it was introduced into the House of Representatives. This analysis of the two measures showed a reduction from 45 per cent. ad valorem on surgical and dental instruments, or parts thereof, as are included in Paragraph 199 of the present law, to 25 per cent. ad valorem, as in Paragraph 169 of the Underwood bill. And this rate has been even further reduced by the finance committee of the Senate to 20 per cent. ad valorem. When Paragraph 130 was being discussed in the Senate, Senator Smoot moved to amend this at line 17, after the word "ad valorem," by inserting "surgical and dental instruments, or parts thereof, 40 per cent. ad valorem."

The amendment was proposed at the suggestion of the instrument manufacturers of this country, who, as Senator Smoot said, assert that even under the present 45 per cent. rate, fully 80 per cent. of such goods are imported from abroad, and that only about 20 per cent. are manufactured in this country. A reduction of 25 per cent., it was argued, would be extremely detrimental to our manufacturers. The proposed amendment was rejected. Senator Stone, however, promised to give the matter further consideration in the finance committee.

One View of "Friedmann Serum."—After having carefully studied all reports coming to hand through the medium of an extensive exchange list of first-class medical journals, our deliberate judgment is that the so-called "Friedmann serum" for the treatment of tuberculosis is either a fraud or half-baked scientific product, propagated solely for profit. It is destined not only to prove a source of exceedingly and inexcusably disastrous disappointment to the victims who have been attracted through their well-known credulity and the magnificent newspaper exploitation Friedmann has secured for his "cure," but a seriously dangerous remedy as well.

It is needless to say that the State Medical Association of Texas will not sanction the use of any secret remedy, particularly one deemed to be potentially dangerous and coming under such a cloud of disrepute as does the Friedmann serum. Our answer is that when the United States government issues a license to cover the manufacture of this serum, the State Health Department sanctions its use in the state and the Council on Pharmacy and Chemistry of the American Medical Association admits it to the New and Nonofficial Remedies, then, and not until then, will we sanction its use in this state. This is not an unreasonable stand to take because none of the requirements are impossible or difficult to meet. In view of the importance of the subject and the well-known ability and integrity of the physicians composing these bodies, it is strange that those who are exploiting this remedy, if they are honest in their belief in its efficacy, will not submit it for their approval.—*Texas State Jour. Med.*, September, 1913.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

Arizona: Phoenix, October 7-8. Sec., Dr. John Wix Thomas, Phoenix.

Colorado: State Capitol, Denver, October 7. Sec., Dr. David A. Strickler, 612 Empire Building.

District of Columbia: Washington, October 14-16. Sec., Dr. George C. Ober, 125 B St., S. E.

Georgia: Regular, State Capitol, Atlanta, October 14. Sec., Dr. C. T. Nolan, Marietta; Homeopathic, Atlanta, October 1. Sec., Dr. R. E. Hinman, 106½ Whitehall St.; Eclectic, State Capitol, Atlanta, October 14. Sec., Dr. C. W. Miller, 192 W. North Ave.

Idaho: Boise, October 7. Sec., Dr. John F. Schmershall, Jerome.

Kansas: National Hotel, Topeka, October 14. Sec., Dr. H. A. Dykes, Lebanon.

Louisiana: New Orleans, October 27-29. Sec., Dr. A. B. Brown, 34 Cusachs Building.

Michigan: Capitol Bldg., Lansing, October 14-16. Sec., Dr. B. D. Harison, 504 Washington Arcade, Detroit.

Minnesota: University of Minnesota, Minneapolis, October 7-10. Sec., Dr. Thomas S. McDavitt, 814 Lowry Building, St. Paul.

Mississippi: Jackson, October 28-29. Sec., Dr. E. H. Galloway, Jackson.

Montana: State Capitol, Helena, October 7. Sec., Dr. Wm. C. Riddell, Helena.

New Jersey: State House, Trenton, October 21-22. Sec., Dr. H. G. Norton, 429 E. State Street.

New Mexico: Santa Fe, October 13. Sec., Dr. W. E. Kaser, East Las Vegas.

Oklahoma: Muskogee, October 14. Sec., Dr. John W. Duke, Guthrie.

Rhode Island: State House, Providence, October 2-3. Sec., Dr. Gardner T. Swarts.

Utah: Salt Lake City, October 6-7. Sec., Dr. G. F. Harding, 310 Templeton Building.

Wyoming: State House, Cheyenne, October 15. Sec., Dr. J. B. Tyrrell, Laramie.

PSYCHOLOGY AND THE MEDICAL SCHOOL

SUMMARY OF THE REPORT OF THE COMMITTEE ON PSYCHOLOGY AND MEDICAL EDUCATION OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION *

Following the symposium on psychology and medical education[1] before the American Psychological Association in December, 1911, a committee was appointed to investigate and to cooperate with other bodies interested in this matter. The first part of the investigations of the committee forms the basis of the present report.[2]

The committee sent to all the known medical schools in the United States and Canada inquiries regarding the advisability of including psychology as a required subject for medical students. There were 102 American medical colleges from which answers might have been expected. Answers were received from 71, over two-thirds of the presumably active medical schools in this country. No answers were received from the eight Canadian medical colleges. In general the fullest answers were received from the Class A+ medical colleges, while on the other hand, with but few exceptions, the answers from the medical colleges in Classes B and C were most unsatisfactory as regards completeness.

The committee requested information along five lines. The special questions which were asked are given below. It will be noted that matters regarding which inquiries were made were not entirely or strictly psychologic. The inquiries were made broad because the general medical conception of psychology is not that of the professional psychologist or psychiatrist, as some of the answers plainly showed.

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* Members of the committee: Shepherd Ivory Franz, scientific director and psychologist, Government Hospital for the Insane, and professor of physiology, George Washington University Medical School, chairman; E. E. Southard, professor of neuropathology, Harvard Medical School, and director of the psychopathic department of the Boston State Hospital, and J. B. Watson, professor of psychology and director of the psychologic laboratory, Johns Hopkins University. The full report will appear in *Science*, 1913.

[1] Franz, Shepherd I.: The Present Status of Psychology in Medical Education and Practice, The Journal A. M. A., March 30, 1912, p. 909.

[2] At the present date two other associations have appointed committees with practically the same duties, that is, the American Psychopathological Association, at their meeting in May, 1913, and the American Medico-Psychological Association, at their meeting in June, 1913.

"1. What amounts of time and what proportions of the courses in anatomy (including histology), physiology and pathology are devoted to the nervous system?"

The individual answers to this question were on the whole unsatisfactory. Many of the colleges reported the numbers of hours without the percentages, others gave the percentages without the numbers of hours, and in only a comparatively few instances was the information complete. A tabulation of the answers, so far as this could be done, is given in Table 1.

TABLE 1.—ANSWERS RECEIVED FROM MEDICAL COLLEGES

	Hours	No. of Answers	Percentages	No. of Answers
Anatomy	123	26	17.5	17
Physiology	71	31	22.5	22
Pathology	30	22	12.3	18

From these averages the individual answers varied greatly. In anatomy there were reported 54, 55 and 60 hours by three schools, and 185, 192 and 246 hours by others. In physiology, two schools reported 18 and 20 hours, respectively, and two others 139 and 150, respectively. In pathology, the smallest amount of time was 5 hours, the greatest 60 hours. These variations may indicate differences in conception of different teachers of the relative importance of the nervous system, or, what appears to us likely in some cases, misunderstanding of the terms used. It is not reasonable to suppose that any school gives only fifty-four hours for dissection, demonstration and lectures on the nervous system, or eighteen hours to its physiology. In two widely used text-books of physiology the nervous system is given, respectively, 32 and 39.5 per cent. of the total space. It is probable that the term "nervous system" was, in a number of cases, used by our correspondents to denote only the central nervous system, and was not understood to include such obvious parts as the peripheral nerves and the organs of special sense. It is interesting and important, however, to note that, even with these probable underestimations, the total time assigned to the study of the nervous system averages about 10 per cent. of the total time of the first two years of the medical curriculum. If the question had specified "nervous system, including central and peripheral, and organs of special sense" it seems likely that most of the lower estimates would have been increased in anatomy and physiology so that nearly 15 per cent. of the time of the first two years would be shown to be devoted to the nervous system.

The committee believes that while it may be possible to teach anatomy, physiology and pathology without reference to psychologic matters, in practice this is rarely done. In considering the present status of psychology in the medical curriculum, account should therefore be taken of the inclusion in anatomy of a modicum of psychology, and in dealing with such matters as sensation and perception in the courses in physiology we must remember there is no strict separation of psychologic facts and theories from those of a physiologic nature.

"2. How far do the third (or fourth) year courses in nervous and mental diseases take up the biologic sides of neurology and psychiatry?"

From the answers received it is apparent that in a large proportion of our medical schools, neurology and psychiatry are taught as clinical subjects—diseases are described, differential diagnostic signs are discussed and methods of treatment are suggested. The broader aspects of these subjects are apparently not even hinted at in many schools, although a superficial reading of many of the answers might lead to the opposite conclusion.

"3. Are there elective or graduate courses in medicine which deal with the relations of neurology, psychiatry and psychology, and how much time is given to them?"

Only two schools out of sixty which answered this question replied in the affirmative. It is apparent that students and graduates in medicine who incline toward practice in diseases of the mind and nervous system have few or no opportunities in the medical schools of this country to acquire a broader acquaintance with the subjects of neurology and psychiatry than the clinical courses offer, but must turn to some other source. At times, courses have been given in connection with psychiatric institutes or hospitals for the insane to fit their own appointees for the work they may be expected to perform. With the exception of an apprenticeship in a hospital for the insane, and this is not always adequate, there is at present no possible means of getting an adequate conception of and training for dealing with the mass of nervous and mental disorders which is encountered in general practice. When it is realized that the proportion of insanity is greater than 1:300 of the general population, it is a matter for wonder that the medical schools do not offer adequate means for the acquirement of knowledge along these lines. It is not an exaggeration to say that the courses on insanity and neurology in medical schools are inadequate in time and usually quite unfit in character to prepare the student of medicine for this difficult part of his practice.

"4. Is there any correlation or cooperation between the department of psychology in the academic department and the department of neurology and psychiatry in the medical school?"

Three schools failed to answer this question; three others did not answer it because they were two-year schools, but their failure to answer for this reason indicated plainly that there was no cooperation or correlation between the medical work and the department of psychology in the college of arts and sciences. Eighteen other schools reported that they had no academic connections; thirty-three definitely reported no cooperation; one gave an unqualified affirmative answer and the remaining thirteen answered with more than a brief affirmation by giving indications of the character of the cooperation. Of the fifty-two schools which have affiliations, close or remote, with academic departments, only two-sevenths report any form of correlation or cooperation with the department of psychology, but a careful reading of the answers shows that not more than half of these have any definite form of cooperation or correlation. At the most the replies show that in some institutions academic students who are interested in psychology may attend certain courses in the medical school, and that in other institutions medical students are advised to take courses in psychology. It may be concluded that in this respect there is more promise than accomplishment.

"5. In view of the increasing realization of the importance of the mental factor in medicine, is it your opinion that (a) it would be advisable to have given to the students special instruction in psychology, and if so, (b) at what stage of the medical course would this course be best given?"

Only four of the seventy-one medical schools failed to answer the first part of this question. The numbers and percentages of the different replies are as follows: Fifty affirmative, or 75 per cent.; seven negative, or 10 per cent.; ten qualified affirmative and negative, 15 per cent. In addition it is worthy of note that eleven medical schools have already introduced (or plan to introduce next year) psychology into the curriculum or require it for entrance, and one school advises students to take a course in psychology in the preparatory premedical years.

Of the fifty schools which indicated their belief that psychology should be introduced into the medical curriculum, forty-seven have also indicated the position such work should occupy. Twenty-seven of these schools advise that it be placed in the premedical preparatory years or in the first two years of the medical course, and of this number twelve refer, explicitly or by implication, to the dependence of psychology on the facts of anatomy and physiology, and advise its introduction at a time when the courses in the anatomy and physiology of the nervous system are being given or after they have been completed. Although admitting its value, four schools would dismiss psychology by including it as a required course in the premedical years. The other eleven schools advise that a second course be given during the third or fourth years in addition to the requirement of the first years of the medical work. They would divide the instruction in psychology into two portions, the first to be offered to students during the first part (including the premedical years) of the medical course, the second during the last two years of the curriculum. Another school receiving only college graduates, who usually have an academic course in psychology, also plans to have a course in psychopathology in the later years. Twenty schools stated that psychology should be given in the final years, most of these insisting that its place was a part of, or as a special preparation for, the work in nervous and mental diseases.

It may be urged that the views expressed are those of medical men especially interested in psychology, that is, psychiatrists and neurologists. All inquiries of the committee were directed to deans or secretaries of the schools, and only nineteen of the answers contained quotations or opinions from professors of neurology or psychiatry. The medical specialties of our correspondents, so far as they could be learned, ranged over the whole field of medicine. The decisively negative answers to our fifth question were received from five professors of nervous and mental diseases, one of anatomy and one administrative officer; the doubtful answers were received from two professors of nervous and mental diseases, two of anatomy, one each of physiology, medicine and pathology, and three administrative officers; the positive answers were received from thirteen professors of nervous and mental diseases, five of anatomy, three of physiology, three of pathology, ten of medicine, one of surgery, one of hygiene and fourteen administrative officers whose special medical interests are unknown. If all the answers from professors of nervous and mental diseases be omitted because of possible professional bias, the percentage of replies in favor of the introduction of psychology into the period of medical training is about the same as the general percentage.

From the facts which the committee has been able to gather the following conclusions have been drawn:

1. It appears to be the preponderating opinion that some instruction in psychology is necessary so that students may understand the mental side of their patients, not only of those who are insane but also of many who are never sent to institutions for nervous or mental diseases.

2. In those schools which require one or two years of college work part of the premedical preparation should be devoted to general psychology, or in lieu thereof, a course should be given, preferably in the second year, after the general work in anatomy and physiology of the nervous system has been completed. A briefer course following the physiology of the nervous system would be more desirable than a course in the premedical years. If the earlier course be more extensive and devotes sufficient time to the functions of the nervous system, the advantage of the later course would be counterbalanced.

3. It is the belief of most of the best schools that a second course in psychology should precede the course in clinical psychiatry and neurology. This course should be more practical and should deal especially with abnormal mental processes and with the application of psychologic principles and facts to medical topics. This course should deal chiefly with psychopathology, but it should not be permitted to develop, or degenerate, into a course in psychiatry, neurology or psychotherapeutics. Clinical material should be the basis of the course, but it should not assume the functions of the courses in psychiatry and neurology.

4. Both courses in psychology should be given by competent medical men, although there are at present few medical men who have had sufficient training or have sufficient interest in psychology to warrant their appointment to initiate such work. It seems best, therefore, to recommend that these courses be given jointly and cooperatively by the departments of psychology and psychiatry or neurology.

5. The content of the course or courses in psychology should be the object of careful consideration by representatives or fessors of the departments of physiology, psychiatry, psy- gy and neurology. The first course in psychology, as uctory to the study of medicine, should be a general dealing largely with general psychologic facts, stand- methods, but constant reference should be made ical problems which may be solved by means of the psychologic methods and facts which are discussed. The advanced courses, however, should be practical and should deal with actual medical facts as much as possible. Both courses in psychology should be laboratory or experimental so far as possible, that the student may become personally acquainted with the methods and with the general nature of psychologic experimentation, rather than obtain his knowledge from text-books.

6. More extensive and intensive cooperation between psychologists and physicians is desirable. From the psychologist's standpoint the psychology of medical men is crude; from the medical standpoint the pathology and physiology of the psychologist are out of date. Since both classes have many common interests the knowledge of psychologists should be utilized by physicians, and in turn the experience of more physicians might be made available for the advancement of psychology and psychopathology.

Book Notices

Studies in Small-Pox and Vaccination. By William Hanna, M.A., M.D., D.P.H., Assistant Medical Officer of Health of the Port of Liverpool. Cloth. Price, $3 net. Pp. 52, with 25 illustrations. New York: William Wood & Co., 1913.

Dr. Hanna's book contains the results of his experience as health officer for the port of Liverpool. It consists of three parts: (1) a statistical study of 1,163 cases of small-pox, with special reference to the influence of vaccination in modifying the disease; (2) an analysis of 943 cases of small-pox (with primary vaccination) in relation to scar-area and severity of disease; (3) observations on the interaction of small-pox and vaccination. The study is an exhaustive one and the book is well illustrated with excellent photographs, well printed on good paper.

Hanna draws the conclusions from the first part that the small-pox mortality in the unvaccinated ranges from 25 to 40 per cent. and in the vaccinated is about 3 per cent.; that in the unvaccinated, those at the extremes of life, mainly children under 10 and old persons, suffer the most, the mortality of these two classes reaching as high as 50 per cent.; that in cases in which vaccination does not prevent small-pox, it modifies it to such a degree of mildness that it may be undetected. The conclusions from the second part are that the scar-area of vaccination has an important bearing on the severity of the disease, the larger the vaccination scar, the milder the attack of small-pox, if contracted. From the third part the conclusion is drawn that protection against small-pox is afforded by vaccination even if performed within three days after infection is contracted. The monograph is carefully and conservatively written, all of the statements being supported by facts and records.

Pathologic Inebriety. Its Causation and Treatment. By J. W. Astley Cooper, Medical Superintendent of Ghyllwood Sanatorium, with Introduction by Sir David Ferrier, M.D., F.R.S. Cloth. Price, $1.50 net. Pp. 151. New York: Paul B. Hoeber, 1913.

It is not to the credit of the medical profession that probably a large majority of its members look on the man suffering from an overdose of alcohol as a "drunk" of the more or less common variety. Whatever may be the cause of the intoxication, or whatever one's attitude toward the questions of personal temperance or general prohibition may be, the person who has taken, either in a long or a short period, an overdose of alcohol in any form is quite as much a subject for proper professional treatment as is the victim of morphin or strychnin poisoning. That the majority of physicians need information and instruction on the treatment of inebriety will be admitted by all who have given the subject serious consideration. Dr. Cooper endeavors to show that any efforts to cure inebriety by punishment are not only mistaken but also useless, and that proper medical treatment with adequate legal control is necessary in handling these cases. The natural forms and causes of pathologic inebriety are considered. The author recognizes three forms, dipsomania, periodic alcoholism and chronic inebriety. Dipsomania he defines as a sudden periodic inebriety caused by an insane impulse to take stimulants to intoxication, irrespective of any immediately preceding alcoholic indulgence. The periodic alcoholic he distinguishes from the dipsomaniac in that as long as the periodic refrains from the use of alcohol he has no desire for it, while the dipsomaniac has the impulse whether he yields to it or not. The complications of inebriety are discussed under the heads of delirium tremens, epilepsy, albuminuria and insomnia. Treatment is considered under prevention, treatment by specific drugs, secret remedies and social remedies such as temperance societies, etc. To one familiar with the facts, the author in his reference to the "Keeley Cure" does not convey the impression of exhaustive investigation. In discussing drug treatment the author pays little attention to any other indication. Little emphasis is placed on the fact well known to every person who has seen any large number of alcoholics that the real drunkard, either periodic or chronic, always stops eating as soon as he begins drinking. The result is that the man who has been on a protracted debauch is not only suffering from alcoholic poisoning, but is also in an acute stage of malnutrition. The atropin and strychnin treatment and the system of treatment devised by Dr. Alexander Lambert of New York are discussed in detail. The book is not a particularly profound or exhaustive discussion of the subject but should be of value in attracting attention to a much-neglected field.

SAFEGUARDING THE SPECIAL SENSES. General Advice Regarding the Use and Preservation of the Eyes, Ears, Nose and Throat. By Henry O. Reik, M.D. Cloth. Price, $0.75 net. Pp. 123, with 4 illustrations. Philadelphia: F. A. Davis Company, 1912.

This is the result of fifteen years of experience in treating diseases of the eye, ear, nose and throat. Reik's experience has convinced him that the public needs more careful instruction as to the protection and preservation of the special senses. In the preface, he says, "The child is not expected to know that snoring generally means obstructed respiration, that recurring attacks of pain in the ear mean an abnormal growth in the nose or throat, or that inability to clearly see the school blackboard, or headaches following study are indications of bad eyes . . . The parents are but little wiser. Disinclination to study, a tendency to 'hook school' or failure to maintain a satisfactory class standard are much more frequently due to poor vision or eye-strain than to original sin." Parents are also negligent regarding their own sense organs. Reik's object is to present in a small volume, at a low price, information for the care of the eye, ear, nose and throat that will enable a reasonably intelligent person to keep these special sense organs healthy. The chapter on the eye includes a discussion of eye-strain, care of the eyes, reading-lights, foreign bodies, common afflictions and subjective sensations.

COMMERCIALIZING PROSTITUTION IN NEW YORK CITY. By George J. Kneeland, with a Supplementary Chapter by Katherine Bement Davis, Superintendent of the New York State Reformatory for Women. Introduction by John D. Rockefeller, Jr., Chairman of the Bureau of Social Hygiene. Cloth. Price, $1.30 net. Pp. 334. New York: The Century Company, 1913.

This report is the most elaborate and exhaustive of any yet issued. While covering much the same ground as the report of the Chicago Vice Commission, the experience of the investigator in preparing the first report is noticeable in the last one. The work in both cities was under the direction of Mr. George J. Kneeland. Three other volumes are planned for the present series, the object of the bureau being to collect, study and publish accurate and reliable information regarding the world-wide character of the traffic in vice. Two volumes will deal with the condition of social morals in the leading cities of Europe and with European police systems. The fourth volume will be based on studies made in different cities of the United States.

The material in the present volume is divided into two parts: first, the information secured and tabulated by Mr. Kneeland of actual conditions in New York City, and, second, a report on 647 women committed from New York City to the State Reformatory for Women. This part of the report is prepared by Katharine B. Davis, superintendent of the reformatory, and is largely based on information furnished by the women themselves. The report confirms the existence, not only in New York City, but also throughout the country, of an elaborately organized business for the exploitation of women by men. Probably the most interesting single fact is that brought out by Miss Davis on the mentality of inmates of the State Reformatory. Of 116 of these women, selected at random, and carefully examined by the Binet test, not one showed the mental development which would be normal for a child of over 12 years, twenty-nine had the mental development of 9-year-old children, forty-four of 10-year-olds and twenty-six of 11-year-old girls. From the entire study, Miss Davis concludes that approximately 30 per cent. of those studied are markedly mentally defective, and that this is an extremely conservative estimate. This fact indicates that prostitution is rather a question of mental development and normal mentality than it is of morals or moral impulses.

This report, with the reports from Chicago, Minneapolis and Cincinnati, form the most comprehensive collection of data on this subject available. The book will be read with deep attention by students of social conditions, and the publication of the three remaining volumes of the series will be awaited with interest.

HANDBOOK OF DISEASES OF THE EAR. For the Use of Students and Practitioners. By Richard Lake, F.R.C.S., Surgeon, Diseases of the Ear, London School of Clinical Medicine. Fourth Edition. Cloth. Price, $3 net. Pp. 287, with 81 illustrations. New York: William Wood & Co., 1912.

This little book contains descriptions of the anatomy and brief discussions of diseases of the ear, more particularly the surgical affections. It might be criticized in that it affords, perhaps, a too meager description of many difficult conditions and operations which the author attempts to present. A book on such an intricate organ as the ear and the hearing apparatus, if it is to be of value to the aural surgeon, should be more complete and extensive; but if intended only for the student and general practitioner, as this handbook purports to be, its brevity would make it amount really to a series of definitions of conditions in the hearing apparatus, many of which are difficult to handle even by the expert, and would not be of much assistance to the student or practitioner. The descriptions are well written, however, and the book is abundantly illustrated with splendid drawings and four colored plates.

A STUDY OF THE BACTERIA WHICH SURVIVE PASTEURIZATION. By S. Henry Ayres, Bacteriologist, and William T. Johnson, Jr., Scientific Assistant, Dairy Division. Paper. Pp. 66. U. S. Department of Agriculture, Bureau of Animal Industry, Bulletin 161.

This pamphlet contains the results of experiments in the Bureau of Animal Industry to determine the survival of bacteria after pasteurization by the methods usually employed, both the flash and the holding process. It contains interesting data as to the effectiveness of pasteurization of milk, and should be a valuable pamphlet for the information of health boards, and for distributers of milk who attempt to pasteurize their product.

UNIVERSITY CONTROL. By J. McKeen Cattell, Professor of Psychology in Columbia University. Cloth. Pp. 484. Price, $3.00 net. The Science Press, Garrison, N. Y.

A plea for academic freedom for the individual professor in the university and a protest against autocratic methods of control. A historical retrospect points out how early universities became famous and influential at times when they enjoyed this freedom and how influence waned when this freedom was lost. The greatness of the universities of Germany and elsewhere during the nineteenth century was when academic freedom and the independence and influence of the professor attained a remarkable supremacy. In comparison with the German universities the author states that "no efficient machine driven by the president of an American university can grind out such flour." A series of two hundred and ninety-nine unsigned letters from professors in various American universities are reproduced, and of this number, two hundred and fifty-three favor a greater faculty control of universities or a representative plan suggested in a previous article by the author, allowing of a greater democracy in university control.

The Practice of Urology. A Surgical Treatise on Genito-Urinary Diseases, Including Syphilis. By Charles H. Chetwood, M.D., LL.D., Professor of Genito-Urinary Surgery, New York Polyclinic. Cloth. Price, $5 net. Pp. 824, with illustrations. New York: William Wood & Co., 1913.

There is no dearth of books on genito-urinary surgery, and another addition to the list is not apt to excite the attention that it may deserve. The author's claim to distinction in the preparation of this book is in the fact that he has aligned the subject-matter as seemed to be most practical and desirable from both a surgical and a clinical aspect, beginning with diagnosis and general technic and following with the various abnormalities and diseases of the different anatomic regions, subdividing the operative surgery in like manner. The characteristic features embodied in this book which give it a modern status are the present local treatment of gonorrhea, the application of serum diagnosis and therapy, advancement in cystoscopic and functional renal diagnosis, and the latest on salvarsan therapy. The author is evidently considerably impressed with the value of the Phylacogens, in which many close clinical observers of wide experience differ from him. There is no reason why a method of treatment, young and unsupported by actual clinical results, should be given a place in a text-book. He is decidedly in favor of treatment by vaccines and serums. Urethroscopy and cystoscopy are well described—better than in most books on genito-urinary surgery. The illustrations supplement the text admirably.

The Pros and Cons of Vivisection. By Dr. Charles Richet, Professor of Physiology in the Faculty of Medicine, Paris. With a Preface by W. D. Halliburton, M.D., LL.D., F.R.S., Professor of Physiology, King's College, London. Cloth. Price, $1. Pp. 136. New York: Charles Scribner's Sons, 1912.

Richet is at the head of the Department of Physiology in the Faculté de médecine de Paris. His discussion of vivisection might, therefore, be considered authoritative. In spite of the amount of existing literature on the subject, this little book will be read with much interest by those concerned in the preservation of freedom of research. It will also help the honest seeker after knowledge on this question to clear, accurate information and expert opinion. It is too much to hope that it will have any influence on the pronounced antivivisectionist, as the necessity for animal experimentation has been proved many times before without any effect on those whose minds are already made up. As the discoverer of serotherapy and a leader in physiologic research for a quarter of a century, Richet can speak with an authority not given to the ordinary scientist. An appendix gives the absolute and relative death-rate from diphtheria in Paris from 1872 to 1905, showing a decrease from eighty to fifteen deaths per hundred thousand after the discovery of antitoxin.

The Report of the Philadelphia Baby-Saving Show. And the Proceedings of the Conference on Infant Hygiene. Paper. Price, $1. Pp. 270, with 61 illustrations. Philadelphia: The Child Hygiene Association, Real Estate Trust Building, 1913.

The educational value to a community of a scientifically arranged and conducted exhibit such as that of the baby-saving show held by the Child Hygiene Association of Philadelphia in 1912 is inestimable. The influence of that exhibit and the conference on infant hygiene held in connection with it extended far beyond the community in which it was held. Similar shows employing portions of the exhibit at Philadelphia were held in various cities through the state, showing the interest created by the Philadelphia show. This beautifully printed report gives in detail, with an abundance of illustrations, the various features of the baby-saving show, together with the papers and discussions at the accompanying conference. It constitutes a valuable record and a guide to other communities in preparing for similar educational exhibits, and its wide circulation would distinctly advance the cause of infant hygiene.

Surgery of the Eye. A Handbook for Students and Practitioners. By Ervin Török, M.D., Surgeon to the New York Ophthalmic and Aural Institute, and Gerald H. Grout, M.D., Assistant Surgeon to the New York Ophthalmic and Aural Institute. Cloth. Price, $4.50 net. Pp. 507, with 612 illustrations. Philadelphia: Lea & Febiger, 1913.

This work well fulfils its mission of providing a small, compact students' hand-book. It is well illustrated with original plates and figures showing the important steps in a given operation.

Photomicrographs of Spirochetes, Entamebas, Plasmodia Trypanosomes, Leishmania, Negri Bodies and Parasitic Helminths. Paper. Pp. 45. War Department, Office of the Surgeon-General. Bulletin No. 1. Washington: Government Printing Office, 1913.

This is a highly interesting and valuable bulletin containing plates of various blood parasites together with a brief description and methods of staining and demonstrating them. An improvement that might be suggested would be the printing of the plates in colors.

Gynecologic Operations. Including Non-Operative Treatment and Minor Gynecology. By Henri Hartmann, Professor of the Faculty of Medicine, Paris. Authorized Translation Under the Author's Supervision by Douglas W. Sibbald, M.B., Ch.B. Cloth. Price, $7 net. Pp. 536, with 422 illustrations. Philadelphia: P. Blakiston's Son & Co., 1913.

Hartmann's views are so well known that it is unnecessary to comment on them. This English translation of his book will be welcomed by those who have accepted his teachings.

Medicolegal

Aid Which One Physician May Request of Another Without Incurring Liability Therefor—Requirements of Professional Courtesy

(Gilday vs. Hennen (N. Y.), 139 N. Y. Supp. 934)

The First Appellate Term of the Supreme Court of New York reverses a judgment recovered by the plaintiff, and dismisses the complaint. The court says that the plaintiff and the defendant were both members of the staff of a hospital in the city of New York. While the defendant was performing an operation on a patient, he desired the plaintiff's aid, and sent a telephone message requesting the plaintiff to come to the hospital to help him out. The plaintiff immediately came to the hospital and went into the private operating room. A woman was on the operating table. Her abdomen was open and she was suffering from a hemorrhage. The defendant said to him: "Doctor, I wish you would finish this operation for me. This woman is bleeding. I can't control it." The plaintiff then finished the operation. The defendant was performing the operation for a fee of $10, and the patient was not strictly a charity patient, although the defendant was paying for the private room. The plaintiff thereafter brought this action to recover the reasonable value of his services.

Ordinarily, of course, when a person requests another to perform services for him, he impliedly agrees to pay the reasonable value of the services rendered at his request. This rule is founded in common sense. Unless the circumstances in which the request is made justify him in the belief that the person requested to perform the services would not expect any compensation, the person requesting the services must reasonably have supposed that his request implied a promise to pay for the services. Such circumstances exist where the relation of the parties is such that the services might well be requested as a matter of personal or professional courtesy or duty.

If, therefore, the plaintiff was entitled to recover on an implied contract to pay for the services rendered, it must be on the theory that there is no professional courtesy or duty requiring a physician to give aid to a brother practitioner associated with him in the same hospital, when the brother practitioner's skill or experience is insufficient to cope successfully with an emergency that has arisen and which may cause disastrous results to a patient under his care. The court is absolutely unwilling to hold that the profession of medicine does not impose such an obligation on its members, nor does it believe that even the plaintiff would seriously contend that the judgment in his favor should be sustained, if it would be sustained only on such a theory.

He urged, however, that this obligation existed only in regard to charity patients in the hospital, and not in regard to private patients in a private room. The distinction which he tried to draw was, in the court's opinion, however, not logical. While a physician is entitled to reasonable compensation for his services from the person benefited, the services which he renders should not be measured by the compensation received. Physicians ordinarily recognize this rule and give the benefit of their skill free to persons who cannot pay for the services rendered, and as a matter of professional courtesy will give reasonable assistance to other physicians. The plaintiff showed that he recognized this rule by joining the staff of a hospital where it was the custom that physicians should treat patients gratis and aid each other in their treatment of public patients.

A physician who claims under an implied contract for his services should show, therefore, that the services were rendered, not as a part of his high professional obligations, or as a matter of professional courtesy, but because he expected to be paid for them. This is the test to be applied in every case where a physician sues on an implied contract. It seems to the court that, where a physician requests the services of another physician to aid him in earning compensation for himself, he is bound to pay for these services; but he has a right to believe that a fellow practitioner in the same hospital will expect no compensation, if his services are sought merely to aid him in an operation from which he himself expects to derive no substantial profit. If the operation had been performed in the public operating room, the plaintiff conceded that he would have been reasonably expected to render the requested aid without compensation; but the true distinction, it seems to the court, was not to be found in the place where the operation was performed, but was to be found in the nature and purpose of the services requested. Since the defendant requested the plaintiff's aid, not for the purpose of earning a fee for himself, but only for the purpose of alleviating suffering or removing an imminent danger, he had a right to expect that these services would be rendered freely and willingly.

Elements of Damage to Physician Compelled to Move from His Old Site

(In re Board of Water Supply (N. Y.), 142 N. Y. Supp. 83)

A special term of the Supreme Court of New York, Ulster County, says that this was a motion on the part of several persons having claims for damages for decrease in the values of their established businesses, because of the taking of lands for the Ashokan Reservoir, etc., to confirm the thirteenth Separate Report of Business Damage Commission No. 1. The city of New York made a counter motion to reject the report. One of the claims was that of a physician. The commissioners took the ground that, as his wife did not choose to charge him anything for the rent of his office and barn, there was no reason why any deduction should be made on such an item in the interest of the city. But the court thinks that, in determining his net earnings, the rental value of such office as he used for his business, in the house, and of the barn should be deducted. The fact, however, that he earned, after the taking of the property where his office was located, nearly or quite as much as he earned before, though proved, did not throw much light on his damage. In place of the patrons evicted by the taking of the land men had come to construct the reservoir and the physician's practice had thus been fictitiously sustained, for when the work was completed his old patrons and his new ones would both have gone. Thus the decrease in the value of his business might become correctly apparent. The rule stated by the Supreme Judicial Court of Massachusetts is: "In estimating the . . . value of the business of a . . . physician, . . . the damages are to be assessed for the actual decrease in value of that business, and not merely for the decrease in such elements of the value as admit of being sold. The decrease in the money value of the petitioner's business to himself is to be estimated." *Earle vs. Commonwealth, 180 Mass. 579.* In finding the injury done to the business of a physician regard should be had for another principle of law. It has been held proper where one whose occupation or business has been interrupted or injured by an act of a stranger, and thereby damaged, to prove any circumstances in abatement of such damages which will tend to mitigate or lessen them. There are so many elements entering into the ascertainment of damage to a physician because of being compelled to move from his old site that it is particularly within the province of a jury to determine them in the light of all the facts and circumstances. The award on this claim is set aside and vacated because of the error herein pointed out.

Liability of Railroad Company for Obstructing Highway and Delaying Physician in Reaching Patient

(Terry vs. New Orleans Great Northern Railroad Co. (Miss.), 60 So. R. 729)

The Supreme Court of Mississippi reverses a judgment rendered for the defendant after the jury had been peremptorily charged to find for it on the ground, apparently, that its negligence in unlawfully obstructing the highway was not the proximate cause of the plaintiff's pain and suffering being increased and prolonged, and of the laceration to her body incident to the method pursued by the physician in delivering her of a child. That, the court holds, was error. The plaintiff, as a member of the general public, had the right to have the highway remain unobstructed so that it could be used by her for any legitimate purpose, and having a physician to travel over it to reach her bedside in order to relieve her pain and suffering was, of course, such a purpose. The defendant, under section 4049 of the Code, owed her the duty of refraining from obstructing the highway for a longer period than five minutes, and it was liable to her for any damage which resulted to her by reason of its having obstructed the highway. While it was hardly probable that its servants could have anticipated that the plaintiff would be in need of the services of a physician at the time they blocked this crossing, and that such physician in his journey to her bedside would arrive at that particular point at that particular time, they could, and ought to, have anticipated that some person traveling along the highway might be detained by reason of its being blocked, and that injury would result therefrom, either to the traveler himself or to some other person. This was sufficient to constitute the negligent blocking of the crossing the proximate cause of any injury which the plaintiff sustained by reason of her physician being detained thereby. Her physician was on his way to the bedside of the plaintiff, who was suffering intense pain and anguish incident to the abnormal presentation of a child to which she was then about to give birth. The highway necessary to be traveled by him in reaching the plaintiff's home crossed the track of the defendant's railroad. When he reached the crossing, he found it blocked by an unusually long freight train. There was, according to his testimony, no opening in this train at any point, and it continued to obstruct the highway for a period of between thirty and forty minutes. According to other testimony, the crossing was blocked for a period of about forty-five minutes. When the physician reached the plaintiff's bedside he found her so much exhausted that he was compelled to relieve her quickly of the child, which he did in about ten minutes after his arrival, some laceration of her body resulting therefrom. The court thinks it clear from the evidence that the plaintiff's suffering was prolonged by the delay of the physician in reaching her bedside, but whether she sustained any additional injury thereby was a question of fact for the jury.

Society Proceedings

COMING MEETINGS

Am. Academy of Ophthal. and Oto-Laryn., Chattanooga, Oct. 27-29.
American Association of Railway Surgeons, Chicago, Oct. 15-17.
American Roentgen Ray Society, Boston, Oct. 1-4.
Clinical Congress of Surgeons of N. A., Chicago, Nov. 10-15.
Colorado State Medical Society, Glenwood Springs, Oct. 7-9.
Delaware State Medical Society, Dover, Oct. 13-14.
Idaho State Medical Association, Pocatello, Oct. 9-10.
Medical Association of the Southwest, Kansas City, Mo., Oct. 7-8.
Minnesota State Medical Association, Minneapolis, Oct. 2-3.
Mississippi Valley Medical Association, New Orleans, Oct. 23-25.
Nevada State Medical Association, Reno, Oct. 14-16.
New Mexico Medical Society, Albuquerque, Oct. 2-4.
Vermont State Medical Society, Burlington, Oct. 8-10.
Virginia Medical Society, Lynchburg, Oct. 21-24.
Wisconsin State Medical Society, Milwaukee, Oct. 1-3.

RHODE ISLAND STATE MEDICAL SOCIETY

Meeting held at Providence, Sept. 4, 1913

Clinical Report on Friedmann's Vaccine

Dr. Harry L. Barnes, superintendent of the State Sanatorium for Tuberculosis at Wallum Lake, read a paper reporting 120 cases of tuberculosis treated with the Friedmann vaccine, an abstract of which follows:

In view of the fact that reports of animal experiments were meager and inconclusive, case reports of those injected with the vaccine were too scanty and the time elapsed after such injections too short to be sure of its safety or value, patients were told of this uncertainty and that the vaccine would be given them only on their own responsibility. Because of the widespread newspaper comments on this subject, with very few exceptions the patients were all exceedingly eager to take the remedy.

Dr. Friedmann injected 69 patients on April 9. On May 28, 43 were given the second injection by him and on June 8, 40 additional patients were given the first injection by Dr. Dwinell, who has charge of the Friedmann Institute in Providence. Eleven other patients were given injections shortly before admission, giving a total of 120 cases.

Sixty per cent. of the patients reported on had been observed five months after receiving the vaccine. Fifty-three per cent. had received two injections, 15 per cent. three injections, and about 6 per cent. four injections. Friedmann has stated that an infiltrate must form at the place of injection and that this will gradually disappear in the course of the next few weeks or months. As long as this tissue exists and during its gradual absorption healing will go on. From this statement it would appear that it is the induration and absorption therefrom and not the number of injections on which the improvement depends. In his paper Friedmann claimed that improvement in pulmonary cases began almost immediately after the first injection. Friedmann himself asserted that many of the patients here reported on had improved as the result of the vaccine when he saw them fifty days after the first injection. Concerning these statements, Dr. Barnes said: "We are then to-day in just as good position to judge whether these patients have made a remarkable temporary improvement as we ever shall be. Only two bed-patients were treated on Dr. Friedmann's visits because we had directed them to come last and there was not time to treat all. He selected several cases, however, after he had been informed that cavity signs were present. He examined only one case, in every instance relying on the sanatorium charts."

Smears were taken from abscesses at the site of injection, and examination of the bacilli showed them to have no acid-fast properties during the first twenty-four hours. Cultures taken from the vaccine appeared identical with those taken from the abscesses. Blood examination made from nine patients thirty-four days after injection of the vaccine were negative for tubercle bacilli. Examinations of the urine five days after the vaccine was administered were also negative for tubercle bacilli.

Two guinea-pigs and two turtles injected with the vaccine showed no signs of tuberculosis after several months.

Temperature reactions followed injections of vaccine in thirty, or 25 per cent. of all cases. As a whole these reactions were very similar to tuberculin reactions. Test examinations made during or shortly after the fever showed no focal reactions, so often found during tuberculin reactions, and as a rule the sputum was not increased during the week following the first injection.

Of 117 cases, 55 had a slight increase in the amount of sputum, 45 had a slight decrease and the remaining 17 cases had the same amounts. The average duration of the fever reaction was 2.6 days.

Usually at the end of a week a small hard nodule about the size of a pea and tender on pressure could be felt at the site of injection. Thirty per cent. of the cases failed to develop induration after the first injection. In 25 per cent. indurations resulted in abscesses and in 44 per cent. there were "satisfactory" indurations after the first few days. Indurations usually obtained their greatest size during the second week, except in those cases which developed abscesses. In the twenty-eight cases in which there were abscesses, 6 were slight, 14 moderate and 8 severe. Only four abscesses were reported among 83 men, while 24 of the 47 women developed abscesses. Most of the abscesses ruptured spontaneously between the third and sixth week after the injection.

There was no increase of leukocytes on the day following the inoculation and no marked leukocytosis during the reaction.

Dr. Barnes described minutely cases of various types. Of the 120 cases, tubercle bacilli had at some time been found in 99, or 82 per cent. Of the remaining 21 cases, there had been both hemoptysis and pleurisy in 7 cases, hemoptysis alone in 5 cases, pleurisy alone in 3 cases and the subcutaneous tuberculin tests in addition to physical signs in 4 cases. Most of these patients were second-stage patients. Only 5 were far advanced and only 1 was near death when the vaccine was given. Of 113 patients, 110 had received sanatorium treatment for periods varying from a few days to twenty-four months, during which they had gained from one to fifty-seven pounds. Had all the patients been discharged from the institution on the day the first treatment was given, their condition would have been classified as follows: arrested, 12; apparently arrested, 3; quiescent, 20; improved, 53, and unimproved, 32.

Friedmann has asserted that soon after the first administration of the vaccine there occurs a striking subjective improvement in practically all of the symptoms of the disease. The majority of the patients continued to cough much the same as such patients usually do cough in sanatoriums. Many improved in this respect and some did not. No unusual improvement was noted, but some patients coughed much worse after the administration of the vaccine.

Of 74 patients whose twenty-four-hour amount of sputum was measured the sputum was decreased in quantity in 56 per cent., showed no change in 12 per cent. and increased in 31 per cent. Of 74 control patients the amount of sputum was reduced in 51 per cent., remained the same in 11 per cent. and was increased in 37 per cent. This comparison is slightly in favor of those taking the vaccine. Fifteen per cent. of the 47 patients whose sputum had been positive before inoculation showed no tubercle bacilli four months after the first injection.

Barnes believes that, taken as a whole, the patients' appetites remained about the same except in those who had temperature reactions, in several of whom the appetite was worse.

Forty-two per cent. gained weight in amounts ranging from ¼ pound to 28½ pounds. Fifty-seven per cent. lost weight in amounts ranging from ¼ pound to 15½ pounds. Only about 18 per cent. of the patients under ordinary sanatorium treatment lose weight. In his judgment, hypnotics have been used fully as frequently in the vaccine treated as in other cases.

As Friedmann laid much stress on the relief of chest pain and discomfort, 70 patients were questioned in regard to this symptom between two and four months after the first injection. Of these, 28 had no pain before or after, 23 had the same amount, 14 less and 5 had more.

"From this," said Barnes, "we certainly cannot subscribe to Friedmann's statement that soon after the injection of his vaccine the patients lose all their troubles."

The analysis of temperature charts shows not only that the vaccine does not control but also that it induces fever. Friedmann claims that hemoptysis is never observed in consequence of or following the injection. An analysis of the records shows that the incidence of hemoptysis was slightly greater among those who took the vaccine than among those treated by ordinary methods.

In 115 cases physical signs before the first treatment were compared with the physical signs at the last recorded examination. The signs were rated as being about the same in 57 cases, as more in 35 cases and less in 23 cases. Taken as a whole, there certainly was no unusual tendency toward disappearance of signs.

On September 1, when the statistics of the present results were compiled, the average time which had elapsed since the first injection was 120 days, or about a month less than the average sanatorium residence of patients. The present condition of only 85 patients is known, and as compared with their condition at the time of the first injection of vaccine, 17 are better, 34 the same and 34 worse. From this it appears that 40 per cent. of the patients in this series are not in as good condition as when they received their first injection. The proportion of patients discharged from the sanatorium as unimproved under ordinary forms of treatment has never exceeded 23 per cent.

The unfavorable result in many cases appears to be due to the increased activity of the pulmonary lesions as a part of and following reaction to the vaccine. In several cases the signs of increased activity have subsided or are subsiding, while in others, even after five months, there is, as yet, no signs of decreased activity. Dr. Barnes then offers the following conclusions:

"This report offers no evidence as to whether or not the vaccine can prevent tuberculosis in those who are free from it, as no healthy persons were inoculated.

"It offers no evidence as to the liability of the vaccine to induce local or general tuberculosis, as this can be determined only by necropsy or special bacteriologic work.

"One patient with joint tuberculosis showed striking improvement, which makes it desirable that similar patients who have received this vaccine should be observed and reported on by those who have had orthopedic experience. The four other patients having active tuberculosis outside the lungs have not shown unusual improvement.

"The 120 patients having pulmonary tuberculosis have shown none of the immediate and wonderful results reported by Friedmann and others before the Berlin Medical Society. On the contrary, about 17 per cent. of the cases have shown an increased activity of the disease, which would not have been expected under ordinary sanatorium treatment."

Following the reading of Dr. Barnes' report the meeting was thrown open for discussion.

Dr. Dwinell, who is at the head of the Friedmann Institute in Rhode Island, criticized Dr. Barnes for reporting cases which had received only one or two injections. He stated that the report dealt too much in statistics compiled from the records of the institution and too little with subjective symptoms as obtained from the patients. He cited some of the cases reported on, which he claimed had shown wonderful improvement. He concluded by saying that the statistics were inaccurate and the report of questionable value. Dr. T. J. Smith said that he had talked with and examined these patients at the sanatorium. They had told him they felt better. He could not understand Dr. Barnes' report or why it was made at this time.

Mr. W. L. Harris said that he had not observed the pulmonary cases, but that some of the joint cases had improved, and he thought that these cases should be observed by more physicians than were doing so at present. Dr. J. T. Farrell, who had radiographed some of the joint cases, said that they showed improvement.

Dr. Jay Perkins said that patients who had come under his observation had not shown the marked improvement they should have shown in view of statements made concerning the Friedmann vaccine. He had seen one patient who developed fever after the second injection and has continued to fail since. He believed that Dr. Barnes' statistics were accurate.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

September, VI, No. 3, pp. 151-224

1 Dyspituitarism. M. S. Reuben, New York.
2 *Wassermann Reaction in One Hundred Infants. K. D. Blackfan and S. T. Nicholson, Baltimore, and T. W. White, St. Louis.
3 *Wassermann Reaction in Hereditary Syphilis, in Congenital Deformities and in Various Other Conditions in Infancy. L. E. Holt, New York.
4 *Luetin Reaction in Infancy. A. Brown, New York.
5 *Results with Salvarsan in Hereditary Syphilis. L. E. Holt and A. Brown, New York.
6 *Results of Treatment with Salvarsan in Late Congenital Syphilis. G. S. Strathy and G. A. Campbell, Toronto.
7 Rapid Clinical Method for Estimation of Total Fat in Infants' Stools. D. M. Cowie and W. S. Hubbard, Ann Arbor.

2. Wassermann Reaction in 100 Infants.—In this investigation the serums from 101 infants, irrespective of the reason for which they were in the hospital, were tested. The technic employed was that advocated by Wassermann, and in forty-three instances this was supplemented by tests made according to the method of Noguchi. The blood was procured by means of the suction apparatus described by Blackfan. In Group I there were 68 children, none of whom gave, on investigation of their family or past history or by physical examination, any evidence of hereditary syphilis. The Wassermann reaction was negative in 66, doubtful in 1 and positive in 1. The Noguchi modification was made in 43 of the cases in this group, and verified the results of the Wassermann test; i. e., 41 serums were negative, 1 was doubtful and 1 was positive. In Group II no clinical evidences of hereditary syphilis were found in 30 infants. In 2 infants the family history was suggestive. In 1 infant, the family and past history and the physical examination were suggestive of syphilis. The Wassermann reaction was negative in 32 of the infants and positive in 1 infant.

3. Wassermann Reaction in Hereditary Syphilis, Etc.—Holt claims that cases of hereditary syphilis almost invariably respond positively to the Wassermann test, even when previously treated by mercury, unless the treatment has been very thorough and protracted. After the use of salvarsan it has been his experience that it disappears much more regularly and earlier, but even then in most cases only after repeated injections. Of 178 tests made in hospital patients showing no definite signs of syphilis, positive reactions were obtained in but eleven and five of these were shown on fuller investigation or subsequent findings to be pretty clearly syphilitic. Two of the remaining six were doubtfully so. The great portion of congenital deformities Holt believes have no relation to syphilis, since not a single positive reaction was obtained in fifty-six consecutive cases.

Of sixty-two patients suffering from malnutrition or marasmus, only five gave a positive reaction, and are included in the group above mentioned. Of the remaining fifty-seven, nearly one-third had very considerable enlargement of the spleen or liver, or both. Since the cases examined were selected from a much larger number, as those most likely to be syphilitic, Holt cannot regard syphilis as a common cause of marasmus, certainly in the patients admitted to the Babies' Hospital. Since the error, when one exists, is almost invariably on the positive side, the technic of those who find a very large proportion of positive reactions among maramus patients in institutions is open to suspicion, he claims.

4. Luetin Reaction in Infancy.—In all Brown made 134 tests. Thirty-four were in patients with hereditary syphilis, and 100 in controls. Of the syphilitic infants all but four gave a positive luetin reaction. In the 100 controls, ninety-six were definitely negative and four gave a doubtful reaction. All of the negative cases were also negative to the Wassermann test. In all the cases regarded as syphilitic the diagnosis was confirmed by the Wassermann reaction and the clinical history. Of the syphilitic patients with a negative luetin reaction, all four were cases of severe infections and either the hemoglobin was very low or the skin much thickened so that one could not be certain of a positive reaction. Of the thirty positive luetin cases, fifteen showed small pustules; the other fifteen reacted in the form of a definite inflammatory papule. In addition it was observed that the more energetic the treatment the more distinct was the reaction. Especially was this the case after salvarsan injections. There were fourteen infants in whom the test was repeated after injections of salvarsan; of these, eight became negative during an average period of five months after the first injection of salvarsan. In each instance the Wassermann reaction corresponded with the luetin test. i. e., it became negative at or about the same time. In the remaining six positive cases the reaction was present at the time of the last test made, which averaged three and a half months after the first injection of salvarsan. In this group also the Wassermann corresponded with the luetin test.

5. Salvarsan in Hereditary Syphilis.—Holt and Brown summarize their paper as follows:

> 1. Immediate and striking benefit follows the injection of salvarsan in hereditary syphilis, and this is seen in many patients in whom mercury has been used with little or no apparent benefit. 2. Salvarsan must be given intravenously; with the technic which we have described its administration is not difficult and it is practically free from danger. 3. A single dose of salvarsan does not cure hereditary syphilis, although it often removes the visible symptoms. Relapses, however, are to be expected unless the dose is repeated. With present experience it seems advisable to repeat the injections at intervals for one year, even though no symptoms are present. 4. The best results in hereditary syphilis are undoubtedly obtained by the early use of salvarsan followed by mercurial treatment. 5. Even with the aid of the Wassermann reaction it is difficult to say when a child with hereditary syphilis is actually cured.

6. Salvarsan in Congenital Syphilis.—The authors' eighteen patients improved clinically under salvarsan treatment. The intensity of the Wassermann reaction diminished steadily with frequently repeated full doses, but in nine patients over 4 years, who received four doses or more, only two became negative, and that after eight and nine doses. They found that the younger the child, the more quickly does the Wassermann reaction become negative. They have not found the administration of salvarsan by intravenous injection in children to produce any bad effects.

American Journal of Medical Sciences, Philadelphia

September, CXLVI, No. 3, pp. 313-468

8 Lobar Form of Bronchopneumonia of Long Duration, Occurring in Children and Young Adults. D. Riesman, Philadelphia.
9 True Value of Operation for Cancer. E. M. Foote, New York.
10 *Therapeutic Artificial Pneumothorax. H. M. King and C. W. Mills, New York.
11 *Diagnosis of Tuberculosis of Kidney. F. E. Keene and J. L. Laird, Philadelphia.
12 Invagination of Meckel's Diverticulum Associated with Intussusception: Report of Case, with Study of Recorded Cases. A. E. Hertzler and E. T. Gibson, Kansas City, Mo.
13 Spinal Gliosis Occurring in Three Members of Same Family, Suggesting Familial Type. G. E. Price, Philadelphia.
14 Technic of Abderhalden's Pregnancy Reaction. C. C. W. Judd, Baltimore.
15 Seven Cases of Cervical Rib, One Simulating Aneurysm. N. G. Seymour, New York.
16 *Polyneuritic Form of Acute Poliomyelitis: Clinical and Pathologic Study. S. Leopold, Philadelphia.
17 Intensive Study of Insects as Possible Etiologic Factor in Pellagra. A. J. Jennings and W. V. King, Washington, D. C.

10. Therapeutic Artificial Pneumothorax.—In sixteen cases in which the treatment has been tried by King and Mills two have shown marked and apparently permanent improvement, six have shown temporary or slight improvement, in one case hemorrhages have apparently been controlled, in one case of lung abscess no improvement followed, while in six cases, on account of pleural adhesions, either no gas could be injected or not enough to produce any sufficient collapse.

11. Tuberculosis of Kidney.—Fifty-eight cases of suspected renal tuberculosis were examined by Keene and Laird by the combined clinical, Bloch and subcutaneous laboratory methods. Twenty-two cases were proven, seven by operation and fifteen by subsequent clinical course, to have tuberculosis of the genito-urinary tract; twenty-nine were proven, three by operation and twenty-six by subsequent clinical course, to be non-tuberculous; seven cases were still clinically doubtful. By the Bloch method of inoculation, seventeen cases were positive, forty negative, and one doubtful, due to the same cause. In the clinically proven cases of tuberculosis, therefore, 77.3 per cent. were positive by both laboratory methods. The seven clinically doubtful cases gave negative results by both methods.

Of the clinically proven negative cases all but one gave negative results, and this was positive by both the Bloch and subcutaneous methods. This case was brought to operation on account of the positive laboratory findings; the apparently affected kidney was exposed and split, and showed, macroscopically, an interstitial nephritis and no evidence of tuberculous involvement. Two of the proven positive cases which gave negative laboratory results were closed cases, the ureter of the affected side being obstructed; one had advanced bilateral renal involvement, which shortly caused death; the other two were frank cases of unilateral renal tuberculosis. There were two clinically positive cases, each giving negative results by each of the two laboratory methods and positive by the other. Another positive case showed numerous tubercle bacilli in the inguinal glands of the pig at the expiration of ten days, and only one small focus of infection in the spleen of the other pig at the end of six weeks.

The authors conclude that the kidney is the primary site of disease in tuberculosis of the female urinary tract; as a rule the infection originates from a focus in some other organ and gains entrance to the kidney by way of the blood-stream. The pathology varies greatly in kind as well as in degree, but a definite type usually predominates, altering both the pathologic and clinical pictures. Subjective symptoms referable to the kidney disease are by no means characteristic; they are often entirely lacking, may be expressed by a dull, aching sensation in the lumbar region or by attacks of colic resembling calculus. The most prominent symptoms are those referable to deranged bladder function; starting with painless polyuria, all degrees of dysuria are met, including the most intense strangury and even incontinence. These symptoms may be decidedly intermittent in their severity, with intervals of comparative comfort. A cystitis which does not readily yield to the usual appropriate measures should arouse the suspicion of renal tuberculosis. Some degree of pyuria is the rule; hematuria the exception. Intermittent pyuria suggests tuberculosis of the kidney. Pyuria without demonstrable bacteria by smear or culture in a catheterized specimen is likewise suggestive. Albuminuria is usually present, but small in amount compared to the degree of renal involvement.

In the absence of mixed infection the temperature is normal or shows only a slight evening elevation; irregular fever, with chills and sweats is evidence of a mixed infection or a more generally disseminated tuberculous process. The palpatory findings are dependent on the type and extent of the pathologic changes. While enlargement of the diseased kidney is usually manifest, it is important to remember that compensatory hypertrophy of the kidney may be given erroneous conclusions in determining the diseased organ. Thickening of the vaginal portion of the ureter is of value in diagnosis but by no means characteristic of tuberculous infection. The tuberculin reaction is of doubtful value; the subcutaneous injection should be employed and its results are significant only in the presence of increased kidney or bladder symptoms. By far the most important agent in determining the diagnosis is the cystoscope, which in the majority of cases shows a picture so characteristic that the nature of the infection is at once recognized. Only by its use can we decide the extent of disease as well as the condition of the opposite kidney as regards both its anatomic and functional integrity.

The diagnosis of renal tuberculosis should be made in every suspected case by the combined clinical and laboratory examination. The Bloch method of inoculation of guinea-pigs should be used, because it is equal in reliability to the older method, and the diagnosis may be made in at least 77.3 per cent. of cases in ten days compared to six weeks by the subcutaneous or intraperitoneal methods, which should also be used as controls. A positive laboratory result by either method determines the diagnosis of tuberculosis of the genito-urinary tract; of renal tuberculosis in the female, the exact focus in the male to be determined by additional clinical and laboratory means. A single negative laboratory result, regardless of thoroughness of examination, does not determine an absolute negative diagnosis of renal tuberculosis, as the manifestations of this disease are essentially intermittent. Negative results obtained in three successive weekly examinations should, however, bear considerable weight in the diagnosis.

16. **Polyneuritic Form of Acute Poliomyelitis.**—Leopold cites the case of a young female who, without any previous illness, was suddenly seized with vomiting, fever, pain in the head and back, followed in several days by pain and paralysis in the lower limbs, together with paralysis of the bladder. The important physical symptoms were loss of patellar tendon reflexes and unsymmetric paralysis of both lower limbs, with partial areas of hypesthesia. There was bladder paralysis. In addition there was marked tenderness on pressure over the nerve trunks in the paralyzed extremities, which persisted until death, two months after the onset. At necropsy the heart, lungs, spleen and liver showed no changes. The kidneys showed cloudy swelling. A few punctate hemorrhages were seen in the visceral pericardium. No exudate was noted in the meninges of the brain or spinal cord. The vessels were injected. The cord in the lumbar region was somewhat softer than in the other portions, and on section showed a reddish-gray area in both anterior horns.

Microscopic sections were made from various levels of the spinal cord and medulla oblongata. These sections were stained with thionin hemalum and acid-fuchsin, by Weigert's stain, and by the Marchi stain. Only one peripheral nerve and portion of one muscle were obtained and these were from the anterior aspect of the right thigh, near Poupart's ligament. A portion of the nerve was placed immediately in osmic acid and teazed after twenty-four hours. Another portion was placed in Muller's fluid and studied by the Weigert, hemalum and acid-fuchsin stains. There was no evidence of an acute or subacute inflammatory process, and no distinct degenerative changes were noted. The hemalum-acid-fuchsin stain showed slight increase in the connective tissue. There was no round-celled infiltration. The osmic acid showed slight swelling of the fibers, some granulation of the myelin, but no breaking up into droplets. Most of the fibers were normal with Weigert's stain. The section of muscle showed no round-celled infiltration, no swelling or atrophy of fibers. The striations could be seen, but were not sharply defined. In the medulla oblongata no changes were noted. The cervical and thoracic areas of the spinal cord showed no changes. In the lumbar area stained with the hemalum-acid-fuchsin the meninges showed an intense round-celled infiltration. The pial vessels were dilated and intensely engorged with blood. Around and within the anterior and posterior roots the round-celled infiltration was intense, and the capillaries were intensely dilated. The anterior horns showed the characteristic picture of the subacute stage of an acute poliomyelitis. The left anterior horn was more involved than the right. The capillaries were injected, the round-celled infiltration was marked, and the cells showing a clear protoplasmic area around the nucleus. Many lymphoid cells, a few connective-tissue and polymorphonuclear cells were also seen. The ganglion cells had practically disappeared as only a few were seen, and those remaining were atrophied. With the Nissl stain the disappearance of the ganglion cells and the varying grades of degeneration of those remaining were most marked. No changes were seen in the posterior horns or in the white matter. The Weigert stain showed no sclerosis. These changes were noted in the second, third, fourth and fifth lumbar segments. The changes found in the lumbar region of the spinal cord were those of an acute poliomyelitis in the reparative stage. The anterior horns were practically destroyed. Intense inflammation was noted in the meninges and around the posterior roots. Most interesting was the exudate and inflammation of the spinal roots. The peripheral nerve showed no evidence of a primary neuritis.

American Journal of Public Health, New York

August, III, No. 8, pp. 729-844

18 Year's Work against Typhoid in Yakima Valley and Results Achieved. T. Tetreau, North Yakima, Wash.
19 Rural Typhoid in Manitoba. R. M. Simpson, Winnipeg, Can.
20 Plea for More Wide-Spread Interest in Investigation and Control of Typhoid. W. C. Hanson, Boston, and L. A. Jones, North Adams, Mass.
21 Some Relations between Filtered Water and Typhoid as Shown in Two Years' Service of Wilmington Filters. T. C. Hatton, Washington, D. C.
22 Municipal Control of Typhoid. C. R. Grandy and C. J. Andrews, Norfolk, Va
23 Institutional Vaccination against Typhoid. J. N. Force, San Francisco.
24 Solubility of White Lead in Human Gastric Juice and Its Bearing on Hygiene of Lead Industries. A. J. Carlson and A. Wielfel, Chicago.

Annals of Surgery, Philadelphia

September, LVIII, No. 3, pp. 289-432

25 Esophagoplasty. W. Meyer, New York.
26 Some Surgical Features of Injuries of Spine, with Special Reference to Spinal Fracture. C. A. Elsberg, New York.
27 *Practicability of Reducing Caliber of Thoracic Aorta by Plication or Infolding of Its Walls. R. Matas and C. W. Allen, New Orleans.
28 Some Anatomic and Physiologic Principles Concerning Pyloric Ulcer. G. P. Laroque, Richmond, Va.
29 *Relationship between Gastric and Pancreatic Carcinoma. E. A. Schumann, Philadelphia.
30 Subdiaphragmatic Abscess. D. L. Despard, Philadelphia.
31 *Experimental Anatomic and Physiologic Observations Bearing on Total Extirpation of Colon. A. Schachner, Louisville, Ky.
32 Diverticulitis of Sigmoid. J. Douglas, New York.
33 Hernial Sac in Its Relation to Concealed Intestinal Injuries. C. M. Remsen, Atlanta, Ga.
34 Development of Malignant Disease of Cervical Stump after Supravaginal Hysterectomy. V. N. Leonard, Baltimore.
35 Sacrococcygeal Tumors. R. Ollerenshaw, Manchester, England.
36 *Purpura of Bladder. F. Kidd, London.

27. **Plication of Thoracic Aorta.**—In the light of present knowledge Matas and Allen hold that the direct intervention of surgery in the treatment of aortic aneurysm must be restricted to explorations, both abdominal and thoracic, which will permit us to ascertain the relations of the aneurysmal sac to the parent vessel. In a certain number of cases of saccular aneurysm, it may be possible to obliterate the communications leading from the sac to the artery by the method of intrasaccular suture. In the majority of cases the operation will have to be limited to methods which will simply tend to reduce the circulation in the sac and thus favor the coagulation of its contents. This may be accomplished by any of the classical methods of wiring or by narrowing the lumen of the vessel immediately above or below the aneurysm, by the use of constricting agents, whether metallic (Halsted or Matas-Allen aluminum bands), or tissue strips (aponeurosis, Nassetti; aortic, Halsted), or by suture methods, such as the plicating procedure which has been the special object of the authors' investigations.

29. **Gastric and Pancreatic Carcinoma.**—The conclusions gathered by Schumann from a review of the literature are that secondary invasion of the pancreas is a somewhat infrequent sequel of pyloric or duodenal carcinoma and that in a certain group of cases, in which the pancreas is attacked early in the course of the disease, there may arise a mutual functional compensation between stomach and pancreas, which permits both organs to satisfactoritly perform their duties, with a decided absence of symptoms of disease of either, even though there may be extensive destruction of tissue.

31. Abstracted in THE JOURNAL, Jan. 4, 1913, p. 73.

36. **Purpura of Bladder.**—Kidd cites a case of secondary purpura confined to the bladder and arising in a bacterial infection of the tonsil. The patient, female, aged 12 years, was admitted to the hospital with the history that on Nov. 29, at 8 p. m., she felt a sudden desire to pass water and during the act experienced a sharp stabbing pain starting in the left iliac region and spreading into the vulva. Between 8 p. m. and 9:30 p. m. she passed water four times, each time noticing a similar pain which lasted only as long as water was passing and ceased at once at the end of the act. At 9:30 p. m. she passed water again and this time inspected it. It was full of blood. An aching pain came on in the left iliac region when she went to bed and lasted all night and the whole of the next day. Urine was passed once in the night and five times during the next day to the time of admission into the hospital at 5 o'clock in the afternoon. The patient looked ill and was pale and anemic. Temperature, pulse and respiration normal. Tongue clean and moist. Heart, lungs and alimentary system normal. There was a follicular tonsillitis on the left side and some slight enlargement of the lymph-nodes on the left side of the neck which were tender to the touch. The skin showed no petechiae. The gums were healthy. There was deep tenderness over the bladder region, especially on the left side. The urine was full of blood-clots and contained bright red blood diffused throughout. The patient was put to bed. By the next morning the bleeding had disappeared and the pain had ceased. Further examination elicited the following facts: Roentgenoscopy was negative. Cystoscopy: The bladder was filled with 8 ounces of oxycyanate of mercury solution 1 to 4,000. Both ureters appeared healthy. The bladder wall for the greater part appeared pale and healthy, but scattered irregularly over fundus and trigone were seen patches of submucous hemorrhages varying in shapes and sizes, some linear, some stellate. The greater number were scattered over the fundus. There was no ulceration and no sign of miliary tubercles. Kidd came to the conclusion that it was either a purpuric condition of the bladder wall or a primary blood-infection of tuberculosis at its very onset.

Archives of Ophthalmology, New Rochelle, N. Y.

September, XLII, No. 5, pp. 457-575

37 Keratoconus with Reports of Cases. J. E. Weeks, New York.
38 Experimental Production of Sclerokeratitis and Chronic Intra-Ocular Tuberculosis. F. H. Verhoeff, Boston.
39 Two Cases of Chronic Glaucoma Simplex Treated by Iridotasis. D. Harrower, Worcester, Mass.
40 Case of Microphthalmus with Orbital Cyst; Partial Microphthalmus with Intra-Ocular Changes. F. P. Calhoun, Atlanta, Ga.
41 Case of Traumatic Equatorial Rupture of Sclera. A. Knapp, New York.
42 Treatment of Trachoma with Iodic Acid. J. Rudas, Budapest.
43 Method to Keep Upper Eyelid and Superior Fornix Everted. V. Grönholm, Helsingfors, Finland.

Boston Medical and Surgical Journal

September 11, CLXIX, No. 11, pp. 373-408

44 Gonococcus Vaccines and Glycerol Extracts of Gonococcus in Diagnosis of Gonorrheal Infections. G. C. Shattuck, Boston, and W. S. Whittemore, Cambridge.
45 Pathologic Lesion of Whooping-Cough. F. B. Mallory, Brookline, Mass.
46 Adductor Response to Homolateral and Contralateral Stimulation. A. Myerson, Boston.
47 Fibroma of Ovary Weighing Thirty-Five Pounds. Operation. Recovery. R. S. Titus, Boston.
48 Tests for Renal Function Based on Selective Excretory Activities of Kidney, R. Fitz, Boston.

Canadian Medical Association Journal, Toronto

August, III, No. 8, pp. 643-738

49 Clinical Significance of Autonomic Nerves Supplying Viscera and Their Relation to Glands of Internal Secretion. L. F. Barker, Baltimore.
50 Cancer. T. S. Cullen, Baltimore.
51 Diagnosis and Treatment of Acute Mastoiditis. G. H. Mathewson, Montreal.
52 Diagnosis of Tuberculous Bronchial and Mediastinal Lymph-Nodes. J. H. Elliott, Toronto.
53 Free Suppurative Peritonitis Due to Pyosalpinx. J. Halpenny, Winnipeg

September, III, No. 9, pp. 739-834

54 Pituitary Extract in Obstetrical Practice. B. P. Watson.
55 Intussusception, Its Diagnosis and Treatment, with Report of Seven Cases. A. E. Garrow, Montreal.
56 Insanity and Its Relation to State. C. K. Russel, Montreal.
57 Pain as Symptom in Pulmonary Tuberculosis. R. C. Paterson, Montreal.
58 Retroperitoneal Hematoma as Cause of Intestinal Obstruction. A. R. Mader, Halifax.

Journal of Medical Research, Boston

August, XXVIII, No. 3, pp. 403-508

59 Effect of Different Anesthetics on Pathology of Kidney in Acute Uranium Nephritis. W. deB. MacNider, Chapel Hill, N. C.
60 Morphologic Changes in Tissue with Changes in Environment. Replacement of Surface Epithelium of Grafted Tissue by Adjacent Epithelium. G. M. Smith, St. Louis.
61 *Studies on Complementary and Antihemolytic Properties of Normal Sheep-Serum. F. M. Surface and G. C. Routt, Lexington, Ky.
62 Studies in Metabolism: Selective Action of Certain Bacteria on Peptone. A. I. Kendall, A. A. Day and A. W. Walker, Chicago.
63 *Association of Tuberculosis and Malignant Growths. W. H. Harris, New Orleans.
64 Primary Sarcoma of Liver of Rat Originating in Wall of Parasitic Cyst. F. D. Bullock and G. L. Rohdenburg, New York.
65 Activity and Fixability of Complement in Rat Serum. J. A. Kolmer, C. V. Yui and E. S. Tyau, Philadelphia.
66 *Intravascular Implantation of Rat Tumors. R. Weil, New York.

61. **Properties of Normal Sheep-Serum.**—Surface and Routt found that fresh normal sheep-serum contains a complement capable of dissolving sensitized sheep corpuscles. Sheep-serum is relatively poor in hemolytic complement. It rapidly loses its complement ability on standing. Fresh normal sheep-serum is able to prevent the action of guinea-pig complement. In the fresh serum this inhibiting property is partially masked by the native complement in the sheep-serum. If the sheep-serum is heated just sufficiently to destroy its complement the inhibiting property remains and can be clearly demonstrated. Heating the sheep-serum to temperatures below 52 C. increases its inhibiting properties. Heating at temperatures higher than this tends to destroy this property. If the serum is heated to 60 C. or beyond, both its complement and its antihemolytic property are destroyed. There is an apparent auxilytic action of the guinea-pig complement on the complement of the sheep-serum. This inhibiting property of sheep-serum is not due to complement fixation by antibodies in the hemolytic rabbit-serum. It is probably not due to any precipitate which may be formed by the mixture of guinea-pig and sheep-serum. The evidence indicates that there is a true anticomplement (against guinea-pig complement) in fresh normal sheep-serum. This is present in relatively small amounts, and most of its action is masked by the sheep complement. If the complement is removed from the sheep-serum the anti-complement becomes manifest. The anti-complement is destroyed by heating at 60 C. and higher.

63. **Tuberculosis and Malignant Growths.**—Harris cites the case of a man 45 years of age who presented clinical signs and symptoms indicative of laryngeal neoplasm. The lungs and other organs were normal as far as could be determined by clinical methods. Repeated sputum examinations showed no acid-fast bacilli present; the Wassermann reaction was negative. Operation was decided on, and when the initial incision was made, an irregular growth was seen protruding just between the junction of the thyroid cartilages. Microscopic section showed it to be a distinct epidermoid carcinoma, and a complete laryngectomy was performed with removal of the adjacent lymph-nodes, which latter, however, appeared normal. When the larynx was laid open by a longitudinal incision along the anterior junction of the thyroid cartilages it showed in the gross a definite nodule located just to the left of the median line on the inner side of the thyroid cartilage. The tumor had penetrated the structures and projected slightly on the external surface. It measured 3.5x3x5 centimeters, was of a gray color and presented an irregular surface and outline.

A sectioned surface from within outward through the nodule and the underlying cartilage showed the external gray color extending for a depth of .5 centimeter toward the interior, after which was an area of white color suggesting in certain places caseation which extended down to the cartilage. Between the two zones was an irregular line of demarcation, the white area extending by irregular projections into the overlying gray or tumor zone. The whitish zone which represents the tuberculosis infiltrated considerably beyond the limits of the tumor in the space between the mucosa and the cartilage. The accompanying glands of the excised larynx were normal in size and in appearance.

Microscopic study of serial sections from the summit of the nodule to the cartilage and also of the area immediately surrounding the tumor mass showed the following: the gray zone described in the gross was a distinct epidermoid carcinoma of the spino-cellular type. The deeper cells of the neoplasm were quite rounded and were deeply stained, while the upper part showed more flattened cells with oxyphilic protoplasm, among which were numerous epithelial pearls or "birds' nests." In the stroma of the lower portion were seen epithelioid cell infiltrations with lymphoid and plasma cells scattered here and there. These infiltrations arose from underlying well-defined miliary tubercles, which latter presented a central area of caseation with circumferentially arranged epithelioid cells, a few plasma and lymphoid cells and an occasional giant cell. There was an attempt at repair of these miliary tubercles as evidenced by the connective tissue zone surrounding them. A few scattered tubercles and a diffuse tuberculous infiltration were present beyond the tumor's margin extending between the mucosa and the cartilage. Smears from the caseous areas when stained by Gabbett's method showed a few acid-fast bacilli present. Microscopic study of the lymph-nodes revealed nothing abnormal.

It is now over one year since the time of operation and no evidences of recurrence of either condition are present. The patient has gained over thirty pounds in weight, is of a ruddy color, and apparently in the best of health. It is Harris' impression that the tuberculosis formed a primary pathologic soil on which the tumor probably thus provoked continued to flourish and the tuberculosis in part yielded.

66. **Intravascular Implantation of Rat Tumors.**—The intravascular implantation of tumor tissue was studied by Weil in connection with two types of tumors, a sarcoma and an adeno-carcinoma (Flexner-Jobling strain). A small, nonulcerated, non-necrotic tumor was aseptically removed and cut into minute pieces, so that eventually the mass appeared to have the consistency of a mush. To this mush were added ten parts by volume of .85 per cent. of salt solution. The mixture was thoroughly shaken for a few minutes, and then allowed to stand until the larger particles had settled. The supernatant fluid contained large numbers of isolated cells and a smaller number of cellular masses, composed of aggregates of from three to fifteen or more individual cells. This material passed easily through the needle that was used, and was apparently very well borne by the rats. The injections are made into the external jugular in quantities ranging from 0.5 to 1 cubic centimeter. Only two animals of the entire number treated in this manner died within a few minutes of the injection.

Twenty-one normal rats received intravenous injections of sarcoma suspension. Of these, sixteen presented on autopsy macroscopic evidence of pulmonary tumors. Of the five which failed to show pulmonary tumors three were killed within fourteen days of the injection, and of these three two showed tumors on microscopic examination. Therefore, sixteen of the eighteen rats that were examined more than two weeks after injection presented visible tumors. The size and the number of these pulmonary plants varied within wide limits in any one series, depending on the length of time that was allowed to elapse between the injection and the autopsy. In the earliest specimens the lung appears dotted over with numerous whitish points no larger than the head of a pin. In the later specimens, up to four weeks or more, the tumors have reached the size of peas, are partly confluent, and occupy a very considerable area of pulmonary tissue. These larger tumors, when cut through, present the typical central necrosis which is so characteristic of the subcutaneous plants. There are few other changes of importance. Exceptionally, there is some pulmonary congestion, but never, so far as this series permits of generalization, any pleurisy, either fibrinous or serous. In lungs occupied by fairly large tumors there is often moderate emphysema, and not infrequently there are areas of consolidation, or of hemorrhage in the immediate environment of the tumors. The other viscera show no marked changes.

Journal of Outdoor Life, New York

September, X, No. 9, pp. 257-287

67 Day Camp Costs and Results: Comparative Study of Five Camps in New York. G. J. Drolet, New York.
68 Suitable Cases for Day Camp Treatment. L. B. Mackenzie, Middletown, N. Y.
69 Eligibility for Admission to Day Camps. F. Erdwurm, New York.
70 Some Medical Results of Day Camp Treatment. F. M. Class, New York.
71 Social and Educational Activities of New York Day Camps. J. B. Harriman, New York.
72 Present Status of Day Camp in Treatment of Tuberculosis. A. K. Stone, Boston.

Maine Medical Association Journal, Portland

September, IV, No. 2, pp. 1501-1544

73 Value of Preoperative Study in Major Genito-Urinary Surgery. J. H. Cunningham, Boston.
74 Alcoholic Psychoses. F. C. Tyson, Bangor.

Medical Record, New York

September 6, LXXXIV, No. 10, pp. 415-460

75 Lead-Poisoning in New York City. J. S. Kenney, New York.
76 Psycho-Analytic Delusion. J. V. Haberman, New York.
77 Is There Value in Electrotherapeutics? W. Martin, Atlantic City, N. J.
78 Two Cases of Pancreatic Lesions. J. Meyers and E. G. Benson, Albany, N. Y.
79 Extreme Enlargement of Cavum Septi Pellucidi. W. F. R. Phillips, Mobile, Ala.
80 Ludwig's Angina: Clinical Report of Case. S. H. Brown, Philadelphia.
81 Direct View Irrigating Urethroscope for Diagnosis and Treatment. D. Geiringer, New York.
82 New Salvarsan Needle. J. H. Stevens, Boston.

September 13, LXXXIV, No. 11, pp. 461-506

83 Oral Sepsis. F. P. Kinnicutt, New York.
84 *Clinical Studies on Curative Action of Leukocyte Extracts in Infective Processes. P. H. Hiss and J. G. Dwyer, New York.
85 Chronic Mesenteric Ileus, with Report of Three Cases. T. B. Spence and H. F. Graham, Brooklyn.
86 *Potassio-Mercuric Iodid. D. MacFarlan, Philadelphia.
87 Medicine's Need of Cerebellum. W. B. Konkle, Montoursville, Pa.
88 Dysmenorrhea from Imperfect Development of Uterus or Malformation. J. F. Baldwin, Columbus, Ohio.
89 *Case of Varicose Ulcer Treated by Feeding It with Cheese. G. O. Williams, Greene, N. Y.
90 Intestinal Hemorrhage in Tuberculous. J. M. Cruice, Philadelphia.

84. See abstract 34, p. 622, in THE JOURNAL, Aug. 23, 1913.

86. **Potassio-Mercuric Iodid.**—MacFarlan recommends this drug as being a most effective antiseptic. For purulent ophthalmia, 1 to 10,000 is a good dilution; for ordinary antiseptic work, 1 to 2,000 will be applicable. It has a marked influence when diluted 1 to 2,000 in alcohol and used on a swab when locally applied in diphtheria and scarlet fever in reducing the infective inflammation. In erysipelas the local application stops the mischief most rapidly.

89. **Treatment of Varicose Ulcer.**—Williams cites the case of a large, stout woman, aged 50, doing ordinary farm and dairy household work, whose leg was swollen from old phlebitis and was covered with abundant varices. The leg was abraded Feb. 1, 1913, at the junction of middle and lower third anteriorly and a deep ulcer followed. On May 1 this ulcer measured 2 by 3 inches, and the whole leg and foot were swollen. The patient was unable to abandon her work and give the leg a rest. The general treatment was by means of Blaud's pill.

Local treatment: Soft, well-ripened full cream cheese to which was added a mixture of equal parts of cream and water. The whole was worked into a soft mass. The water and cream were added to prevent drying. This was kept in an ordinary jelly glass. Some of it was spread on a piece of gauze large enough just to cover the ulcer. The application was made morning, noon and night. The patient continued all her domestic duties. The application was painful for the first hour or hour and a half; then the pain subsided and the sore was comfortable until the cheese dissolved. When the empty gauze settled down on the sore it was irritating. The cheese disappeared in five or six hours. The ulcer filled rapidly. May 20 the ulcer was fully healed, no scab even remaining. Williams suggests that it is possible that the salt in the ripe cheese may be responsible for the pain of the application. Patients have not reported as much pain with the soft unsalted cheese curd, though the progress has not been as rapid as in the present case.

Mississippi Medical Monthly, Vicksburg

September, XVIII, No. 5, pp. 87-102

91 Surgery of Appendix. J. W. Barksdale, Winona.
92 Pleurisy of Children. P. R. Brown, West Point.
93 Calcium Sulphid. H. C. Buck, Friars Point.
94 Epithelioma of Ocular Conjunctiva with Presentation of Specimen and Patient. R. Fagin, Memphis, Tenn.

New Jersey Medical Society Journal, Orange

September, X, No. 4, pp. 167-220

95 Social Side of Syphilis. E. E. Worl, Newark.
96 Skin Lesions of Syphilis. C. H. Purdy, Jersey City.
97 Manifestations of Syphilis in Infancy and Childhood. J. Levy, Newark.
98 Syphilis of Eye. E. S. Sherman, Newark.
99 Treatment of Syphilis. H. A. Pulsford, South Orange.

New Orleans Medical and Surgical Journal

September, LXVI, No. 3, pp. 173-268

100 Sarcoma of Small Intestine. E. M. Williams, Patterson, La.
101 *New Self-Retaining Perineal Retractor. M. J. Gelpi, New Orleans.
102 Treatment of Trifacial Neuralgia by Intraganglionic Injection of Alcohol (Hartel's Method). U. Maes, New Orleans.
103 *Serodiagnosis of Pregnancy. C. Jamison and J. C. Cole, New Orleans.
104 *Treatment of Diphtheria and Diphtheria Carriers. S. G. Wilson, New Orleans.
105 Acidosis: Two Types Demonstrable—Endogenous and Exogenous. A. Eustis, New Orleans.
106 Pathology: Basis of Scientific Medicine. A. A. Herold, Shreveport, La.
107 Recent Interesting Work Seen in Laboratories Here and Abroad. W. H. Harris, New Orleans.
108 Hydrophobia and Pasteur Treatment. F. G. Ellis and W. B. Butler, Shreveport, La.
109 Diagnosis of Primary Anemias and of Leukemias. C. Jamison, New Orleans.

101. Self-Retaining Perineal Retractor.—Gelpi's retractor is composed of two sharp tenacula, so constructed that, when applied to the perineum, they remain securely in place, retracting the tissues on either side of the vaginal outlet, without the necessity of assistants to hold the tenacula where they belong. The instrument is simply a self-retaining double tenaculum. It is intended to take the place of the tenacula or Smith-hooks.

103. Serodiagnosis of Pregnancy.—The authors performed this test about sixty times on fifty patients. Three cases of known pregnancy from seventh to ninth month were positive. Three normal cases, from the first to the sixth day after delivery, gave positive reactions. Two ectopic gestations, ten days after operation, gave positive reactions. Two abortions, one three days after the birth of a six months' fetus, the other two months after abortion, with retained secundines, both gave positive reaction. (The latter case was about three months pregnant when the abortion was performed.) One stillbirth, ten days after delivery, gave a negative reaction. One patient with pernicious vomiting, who had not menstruated for two months, and where pregnancy was suspected, gave a positive reaction. One patient at the menopause, who had not menstruated for six months, and who was not pregnant, gave a negative reaction. Two large fibroids, negative. Six patients with pelvic inflammation gave a negative reaction. Ten women who were not pregnant gave negative reactions. These cases included malaria, syphilis, tuberculosis, suppurating abscess of tooth, typhoid, dermatitis herpetiformis, chronic interstitial nephritis, amebic dysentery and other intestinal parasites. Thirteen men gave negative reactions. These cases included typhoid, syphilis, amebic dysentery, uncinariasis, tuberculosis and minor complaints. Four normal men gave negative reactions.

One woman, suffering with acute nephritis and delirious, gave a positive reaction. At autopsy she was proved to be not pregnant. No control of this serum was made, and when they returned to get serum for another reaction the patient was dead. One man gave a positive reaction. The serum, however, was taken just after eating, and no control was made. The patient never returned to the clinic; therefore, his serum could not be retested. Jamison and Cole believe that the serodiagnosis of pregnancy is of definite value, and that when proper controls of the serum and placenta are made that the test is as reliable as any other serodiagnostic method.

104. Treatment of Diphtheria.—Wilson claims that the carriers are best treated by sunshine, segregation and "vaccine therapy." The best results in the treatment of the disease he says are obtained by large doses of concentrated antitoxin, 10,000 units being the initial dose, given intramuscularly, with a period of twenty-four hours between doses, the membrane being the chief guide for repeating the dose, except, of course, in the laryngeal type, and in this type the stenosis and cyanosis serve as guides.

New York Medical Journal

September 13, XCVIII, No. 11, pp. 501-548

110 Discarded Battleships to be Used as Sanatoria and Open-Air Schools. S. A. Knopf, New York.
111 Relative Value of Turtle Tuberculin in Treatment of Tuberculosis. W. J. Beattie, Littleton, N. H., and E. E. Myers, New York.
112 Hygiene of Skin. D. O. Robinson, New York.
113 Internal Causes of Skin Diseases. A. S. Clark, New York.
114 External Causes of Skin Diseases. G. M. MacKee and J. Remer, New York.
115 Therapeutic Value of Oral Prophylaxis and Treatment. G. F. Boehme, New York.
116 Botanic Family Physician. W. R. Riddell, Toronto, Ont.
117 Two New Tests for Detection of Defectives. H. A. Knox, Ellis Island, N. Y.
118 Cerebrospinal Meningitis. M. L. Ogan, New York.

Oklahoma State Medical Association Journal, Muskogee

September, VI, No. 4, pp. 139-182

119 Medical Aspect of Venereal Diseases. C. R. Day, Oklahoma City.
120 Infections of Hand. J. W. Riley, Oklahoma City.
121 Vaccines and Serums: Their Uses and Limitations. B. H. Brown, Muskogee.
122 Fee-Splitting Evil—Surgeon and General Practitioner—General Practitioner and Surgeon. D. A. Myers, Lawton.
123 Progressive Pernicious Anemia. L. A. Riely, Oklahoma City.

Ophthalmic Record, Chicago

September, XXII, No. 9, pp. 533-590

124 Management of Foreign Bodies in Eye and Orbit. E. Stieren, Pittsburgh.
125 Hole at Macula. A. A. Bradburne, Manchester, Eng.
126 Case of Spontaneous Dislocation of Both Lenses into Vitreous. J. C. McAllister, Ridgway, Pa.
127 Complete Bilateral Aniridia: Ectopia Lentis: Pathologic Cupping of Discs. T. B. Holloway, Philadelphia.
128 Case of Pulsating Exophthalmos. G. H. Mathewson, Montreal, Can.
129 Abscess of Lachrymal Sac in Child One Month Old. F. Holdsworth, Traverse City, Mich.
130 Case of Pemphigus of Conjunctiva. J. Bordley, Baltimore.
131 Cacodylate of Sodium in Case of Kerato-Iritis due to Lime Burn. F. Allport and A. Rochester, Chicago.

Washington Medical Annals, Washington, D. C.

September, XII, No. 5, pp. 255-277

132 Retrocalcanean Bursitis C. S. White, Washington, D. C.
133 Case of Pneumothorax. P. B. Johnson, Washington, D. C.
134 Potassium Permanganate as Local Anesthetic to Genito-Urinary Mucous Membrane. W. M. Barton, Washington, D. C.

West Virginia Medical Journal, Wheeling

September, VIII, No. 3, pp. 71-108

135 Surgical Treatment of Goiter. A. Crotti, Columbus, O.
136 Value of Blood-Pressure Estimation. J. J. Goff, Parkersburg.
137 Rupture of Liver. J. E. Cannaday, Charleston.
138 Indications for and Prognosis of Surgical Procedures in Epilepsy. J. R. Bloss, Huntington.
139 Earache. T. W. Moore, Huntington.
140 Present Status of Wassermann Test. S. L. Cherry, Clarksburg.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

August 30, II, No. 2748, pp. 529-584

1 Modern Methods in Diagnosis of Phthisis. C. Riviere.
2 *Nomenclature of Tuberculin Doses. J. A. Codd.
3 Difficult Diagnosis in Insane Person. R. Jones.
4 Treatment of Congenital Syphilis by Salvarsan. J. W. Simpson and L. Thatcher.
5 Physiologic Treatment of Pathologic Scoliosis by Rotation. A. M. Forbes.
6 Acute Pancreatitis: Its Causes, Symptoms and Treatment. A. J. Evans.
7 Sea Bathing. W. J. Tyson.
8 International Aspects of British Health Resorts. N. Wood.
9 Criticism of Methods of Treating Phthisis by "Climate." H. de C. Woodcock.
10 Massage in Fibrositis and Other Painful Conditions. R. Ackerley.
11 Distribution of Cancer Cases in Two Registration Districts of Northeast Cornwall. W. Gordon and W. F. Thompson.
12 Rationale of Plombières Douche. C. W. Buckley.
13 Climate of Brighton in Relation to Disease. E. Hobhouse.
14 Panniculitis. D. D. Brown.

2. **Nomenclature of Tuberculin Doses.**—Codd would select as a final unit the smallest dose likely to be given. For this unit a name *must* be found, and it should be an "unappropriated" Greek letter, with an associated word with meaning suitable to its minute dimensions. Therefore he suggests the letter ψ and the word psilon, which may be conveniently translated "shred," "residue" or "atom." Thus fractions may be obviated, the dose being given in psilons until it reaches the cubic millimeter, and then be given in cubic millimeters until it reaches the cubic centimeter. Another suggestion is the abolition of the practice of speaking of the dose of TR in terms of milligrams of the original bacillary substance, when three-fifths of that substance is no longer present. It is just like speaking of a dose of liquor strychninae, not as 5 minims, or as 1/20 grain, but as the original weight of nux vomica bean from which this quantity of liquid had been made. If, however, clinicians still wish to prescribe TR in terms of weight of the original bacillary substance, it would still be practicable to use the symbol ψ for 100,000 mg. of original bacillary substance of TR and its quantity would be the same as if the dose had been expressed in the Continental fashion—that is, in cubic centimeters of tuberculin fluid. In the method of prescribing tuberculin adopted at the General Hospital, Wolverhampton, they use the psilon unit and the cubic millimeter unit. The cubic centimeter unit is used only when the dose has attained unity or beyond. If this method were generally adopted, Codd says, it would render the use of tuberculin more popular and more intelligible to busy practitioners who do not give their whole time to unraveling these ponderously expressed fractions.

Edinburgh Medical Journal

August, XI, No. 2, pp. 97-192

15 *Psychologic Conception of Disease. A. J. Brock.
16 Trauma in Aggravation of Preexisting Disease. J. G. McBride.
17 Simultaneous Electro- and Phonocardiograms. H. L. Watson-Wemyss and J. D. Gunn.
18 *Case of Congenital Defect of Abdominal Muscles, with Anomaly of Urinary Apparatus. L. Thatcher.
19 Literature and Medicine. J. W. Ballantyne.
20 Local Incidence of Cancer in Relation to Fuel. C. E. Green.

15. **Psychologic Conception of Disease.**—Brock maintains that health consists in an effective, disease in an ineffective, reaction of the organism to its environment. Organisms moving in highly complex environments have developed a unique instrument of adjustment—namely, intelligence—to help them to deal adequately with such environments. Much of what, by a confusion of thought, is called "mental disease" is simply an abnormal reaction of such an organism to its environment—a misuse by it of this intellectual instrument of adjustment. *Natura non facit saltum.* Life proceeds cautiously, repeating again and again the reactions she has found serviceable, before proceeding to experiment further. The repetition, however, is for the sake of the advance; an organism which contents itself with marking time is doomed. Brock aims to demonstrate that certain diseases are best understood from a geneticopsychologic point of view, and that, accordingly, it is first and foremost by the employment of educational methods that we can best ensure the prevention of these diseases in the future. Some of the accompaniments of disease are not themselves, strictly speaking, pathologic. Thus inflammation may be looked on as a perfectly healthy and "normal" reaction to an extraneous stimulus of relatively infrequent occurrence. Or again, in the "mental" field, certain conduct on the part of highly gifted and far-seeing persons is often branded as "cranky" or even insane, when, as a matter of fact, it may have been necessitated by, or at least may form a quite healthy and useful protest against, certain pathologic manifestations in the social environment.

18. **Congenital Defect of Abdominal Muscles.**—On reflecting the skin of the abdominal wall Thatcher was at once struck by the almost complete absence of muscular tissue in the usual situations. Only for an inch or so below the costal margin was there any trace of the recti, each being represented by a thin indefinite band of fibers. Transverse sections through the normal position of the recti above and below the umbilicus, and also through the anterior part of the lumbar region, were stained by van Gieson's method, and no muscular tissue could be recognized in them. The psoas and other posterior abdominal muscles, the thoracic and perineal muscles and the diaphragm seemed normal.' The apex of the bladder was attached to the region of the umbilicus by the remains of the urachus, which was only half an inch long, and took the form of a longitudinal band of fibrous tissue. There was also another cord-like band about an inch long which connected the anterior wall of the bladder to the anterior abdominal wall. The bladder was enormously dilated and hypertrophied. It measured 3 inches from apex to base, and 2 inches across at its widest part. When it was opened by an anterior incision, the wall was found to be between ¼ and ⅜ inch in thickness, and was very firm. The urethral and ureteral orifices were not dilated in any way, and a large probe passed easily from the bladder through the urethra, and vice versa. A fine probe could with difficulty be passed into the ureteral openings, and there was no sign of kinking. It had previously been found impossible to regurgitate urine from the bladder into the ureters by pressure over the viscus, although it could easily be expressed from the urethra. Similarly, on pressing over the ureters, the resistance was so marked that it was doubtful whether any urine passed on into the bladder or not.

Sections cut from the bladder wall in a longitudinal direction showed a great increase in the fibrous tissue elements in all three coats, especially the submucous. The muscular coat was much broken up by this fibrous tissue, the stroma penetrating it from the subperitoneal and submucous layers. The lining epithelium showed catarrh. Both ureters were greatly dilated and tortuous, closely resembling both in size and general appearance the small intestine which lay over them. The walls were thinned, and the dilatation ended abruptly at the bladder, for the intramural portion was very narrow. The ureters entered at their usual situation. They showed no sign of kinking, and were patent throughout. The right kidney was small, with marked hydronephrosis, the left about the usual size, with the pelvis but little dilated. In both the fetal lobulation was well marked. The suprarenals appeared healthy, and the relations between bladder and rectum showed no abnormality. Both testicles were found lying free just below the kidneys, and seemed normal in every way. The stomach was narrow and contracted, the bowel and pancreas normal, with no dilatation of any part of the former. The liver and spleen showed no change. There was no sign of recent or old peritonitis. In the right lung there were considerable patches of bronchopneumonia and collapse in all three lobes, this being the cause of death. The abdominal wall during life was very lax and the thorax markedly prow-shaped anteriorly. There was some asymmetry of the face and pinnae of the ears, and slight congenital dislocation of the hips. The urinary functions had been carried on quite satisfactorily, and the child had thriven well until it developed bronchopneumonia, of which it died at the age of 2 months.

Journal of Pathology and Bacteriology, Cambridge

July, XVIII, No. 1, pp. 1-148

21 *Spontaneous and Artificial Development of Giant-Cells in Vitro. G. C. Weil.
22 *New Method of Marking Paraffin Blocks for Purposes of Orientation or Identification. W. H. Harvey.
23 Regulation of Blood-Volume in Normal and Nephritic Animals. A. E. Boycott.
24 Action of Sugar Solutions on Glass. J. N. Laird.
25 *Epidemic Disease in Rabbits Resembling that Produced by B. Necrosis (Schmorl), but Caused by Aerobic Bacillus. J. M. Beattie, A. G. Yates and R. Donaldson.
26 Poliomyelitis in Sheep Suffering from "Louping-Ill." J. P. McGowan and T. Rettie.
27 *Thyroid. W. Edmunds.
28 Comparative Study of Chemical and Biochemical Properties of Lipoid Substances as Extracted from Pig's Liver and Egg-Yolk. F. P. Wilson.
29 Primary Tumors of Valves of Heart. G. Dean and A. W. Falconer.
30 Biochemical Reactions of Diphtheria-Like Organisms. T. G. M. Hine.
31 *Adrenal Hypernephroma in Adult Female Associated with Male Secondary Sex Characters. E. Glynn and J. T. Hewetson.
32 *Rate of Reproduction of Various Constituents of Blood of Immunized Horse after a Large Bleeding. R. A. O'Brien.
33 *Alterations Produced in Complement-Containing Serums by Introduction of "Lecithin." J. Cruickshank and T. J. Mackie.

21. **Development of Giant-Cells in Vitro.**—In observations on cultures of spleen tissue Weil observed that the presence of foreign particles caused a definite sequence in the migration of different forms of the wandering cells. The polymorphonuclear leukocytes were the first cells to respond and to aggregate themselves about foreign masses. These were shortly followed by lymphocytes. Following these at an interval of from twenty-four to forty-eight hours, there appeared a large mononuclear and protoplasmic cell which had the characters of an endothelial cell. By the time of the appearance of this cell, some of the polymorphonuclear cells were undergoing disintegration. These large endothelial cells had phagocytic qualities and tended to surround the foreign particles in the medium. By keeping accurate records of the numbers of cells migrating to a point it was possible to account for the number of nuclei (within a narrow limit of error) of the cells which migrated to the part. This count was compared with the numbers of nuclei determined in stained sections at the end of the observations. Weil has not observed the fusion of cells to form multinucleate ones, save when the cells involved were undergoing degeneration. When this process of fusion occurred, the cells did not exhibit subsequent phagocytic activity. He has, however, obtained multinucleate characters in cells lacking any sign of degeneration and still showing power to engulf foreign particles. These giant-cells were obtained in a process of nuclear division without visible protoplasmic change. It would thus appear from Weil's observations that *in vitro* the multinucleated cell arising from the large mononuclear endothelial cell has the same mode of origin as the multinucleate cells of fixed tissues as are constantly observed in cultures of connective- and muscle-tissue cells.

22. **New Method of Marking Paraffin Blocks.**—Harvey's procedure consists in embedding in the same paraffin block as the tissue a thin pencil of colored paraffin wax having a melting-point somewhat higher than that of the embedding mass. While this mass is molten, a length of colored wax pencil, sufficiently long to project above the block molds, is placed vertically in the liquid wax in any desired relation to the tissue; this projection of the pencil renders manipulations more easy. The block is then cooled, all protruding paraffin pencil is broken off, and the block is ready for cutting. By this means a clear and definite mark obtains throughout the depth of the block.

25. **Epidemic Disease in Rabbits.**—The epidemic disease in rabbits which the authors describe and which resembles so closely in its morbid anatomy the disease produced experimentally by the inoculation of Schmorl's bacillus is caused by a bacillus which in many of its morphologic characters is similar to *B. necrosis* (Schmorl), but which differs from it in two essential points—its motility and its aerobic character.

27. **Thyroid.**—Edmunds asserts that the thyroid in dogs hinders the assimilation of sugar: the parathyroid glands favor it.

31. **Adrenal Hypernephroma and Sex Characters.**—Abnormal sex characters do not always occur together with adrenal hypernephroma; the present position of our knowledge concerning their relationship to these tumors is summarized by Glynn and Hewetson as follows: 1. In children they are almost invariably present in the form of hirsutes and often other abnormalities (seventeen cases of hypernephroma collected; in sixteen, namely, thirteen females and three males, sex abnormalities present). 2. In adult females before the menopause they are frequently present (twelve cases collected; sex abnormalities present in seven, while in two others menstrual disturbances occurred before death). 3. In females after the menopause they are not recorded, though a growth of hair on the face or change in the voice, etc., might be thought worthy of note (*eight cases collected*). 4. In adult males they are probably invariably absent. In this connection it is of great interest that adrenal cortical rests or bilateral hyperplasia of the adrenal cortex was noted in 15 per cent. of female pseudohermaphrodites, but in only 0.7 per cent. of male pseudohermaphrodites. 5. There is no evidence that hypernephroma in the kidney, which has totally different histologic structure from that in the adrenal, is ever associated with abnormal sex characters.

32. **Reproduction of Blood-Constituents.**—After taking 10 liters of blood from an immunized horse, O'Brien noted the following: The number of white cells varies widely and irregularly. Very small differences are found in the differential count. The hemolytic titer remains practically constant, showing variations of at most 10 per cent. from the initial figure. The total amount of salts present does not decrease, but may be increased 10 per cent. The content of all other blood constituents falls, the hemoglobin and number of red cells falling together to 50 or 60 per cent. of the initial figure. The color index of the new red cells remains at the normal figure. The curve of volume of the red cells does not correspond very closely with that of the number of red cells. The curves of total proteins and of diphtheria antitoxin show a fairly close relationship.

33. **"Lecithin" in Complement-Containing Serums.**—Cruickshank and Mackie found that the introduction of lecithin into complement-containing serum of the guinea-pig does not materially alter the complement dose; in the case of rabbit's serum the complement activity is frequently increased. The albumin fraction from a serum treated with lecithin is as actively hemolytic for sensitized corpuscles as the original complement, while the globulin fraction retains the property of effectively acting with ordinary albumin fraction. The addition of lecithin to ordinary albumin fraction after separation does not enhance the complement activity of the fraction. The lecithin must be mixed rapidly with the serum, or with the water used for dilution, in order to produce the effect described; slow admixture does not yield an active lecithin-albumin fraction. The albumin fraction of a serum treated with lecithin is "absorbed" by complement-absorbing agents; it can also replace complement in the Wassermann reaction. The activity of the lecithin-albumin fraction is dependent on the presence of "complement" in the original serum. Lecithins differ markedly with regard to their power to produce the *alterations described*; a large number of preparations are quite inefficient.

The authors consider that the experiments are of interest as having a bearing on the nature of complement action. It has been demonstrated that, by the use of certain lecithins, the character of the components of complement are markedly altered, and that the complement activity in the case of certain serums may even be increased. They are of opinion that the results cannot be explained by supposing that incomplete splitting of the complement occurs, nor, on the theory of Bronfenbrenner and Noguchi, that the lecithin activates the complement in the albumin fraction in the way in which, for example, alanin does in these authors' experiments. They suggest that the lecithin acts by rendering active a component or complement which is normally present in an inactive or latent state. In the case of guinea-pig's serum this component resembles ordinary middle-piece in its properties, but differs from it in not being precipitable by the passage of carbon dioxid gas. Some modification of or addition to this theory is, however, necessary in order to explain the increase of complement activity which results with certain rabbit serums merely on the addition of lecithin.

Lancet, London

August 30, II, No. 4696, pp. 607-706

34 The Student's Number, Session 1913-1914.

Annales de Gynécologie et d'Obstétrique, Paris

August, XL, No. 8, pp. 449-496

35 *Experimental Radiotherapy of Ovaries. (Les résultats expérimentaux de l'irradiation des ovaires.) A. Lacassagne.
36 *Fatal Chorea during Pregnancy. (De la mort chez les choréiques pendant la grossesse.) G. Lepage.
37 **Diabetes and Pregnancy.* A. Fruhinsholz.

35. Experimental Roentgen-Ray Exposures of the Ovaries.—Lacassagne found that only with high dosage was it possible to sterilize rabbits with the Roentgen rays; in dogs even this was not possible, a number of follicles persisting intact. He thinks that these results testify to the folly of applying the Roentgen rays to sterilize women, as the ovaries are less accessible to the rays in women than in animals. Even if it were possible to accomplish this with intensive exposures, the danger of injury of adjacent organs, intestines, etc., renders it impossible of application. At the same time it seems evident that the Roentgen rays have a special destructive action on the tissues of fibromas and myomas. They also seem to have a destructive action on the riper follicles, and consequently prevent the menstruation otherwise connected with these destroyed follicles. But the exposures must be repeated as other follicles mature. Consequently the practical conclusion from his research is that the exposures may prove useful in causing the retrogression of uterine fibromas; they may also interfere with menstruation by small doses of the rays applied regularly to act on the riper follicles as they develop.

36. Fatal Chorea in Pregnant Women.—Lepage's patient was a nervous Jewess of 25 at the second or third month of her second pregnancy. She complained of restlessness and insomnia and he noticed that there was a slight tendency to motor incoordination in her left arm. He advised her to go to a sanatorium, saying that isolation was needed and supervision of the tendency to choreic movements; no one else had noticed them at that time. She would not go to a sanatorium; the diet was restricted to milk and vegetables and sedatives were given but the disturbances progressively increased until by the end of two weeks there were maniacal excitement and intense, incessant chorea, pulse 110, no fever. An erythema developed on the left arm and chest and the sixteenth day there was incontinence of urine and feces. The latter symptom is universally regarded as of bad omen and the pregnancy was interrupted. The choreic movements diminished in intensity thereafter but the psychic disturbances continued, and the general condition grew rapidly worse, with jaundice, the liver painful and the uterine cervix was seen to be blackish. The woman died the eighteenth day after the first symptoms of the chorea. Lepage has been studying the literature on the subject, and gives summaries of twenty cases in which the women died with no attempt being made to evacuate the uterus. Eleven of the women were in their first pregnancy; five in the second, and two in the fourth. Mental disturbances had preceded the chorea in several cases and the pregnancy was at the third to the seventh month in a number; others had reached term.

In thirteen other cases the uterus had been emptied as a therapeutic measure. Only seven of the women were in their first pregnancy. In four cases the women died within twenty-four hours after the induced abortion; in three others at the third day and in two others at the tenth and twelfth days. The necropsy findings were always negative except for endocarditic lesions in a few cases; softening of the brain was also noted in a few. Only seven of the total thirty-three cases date since 1907. In another group of five cases of severe chorea in pregnant women, induction of abortion was followed by the subsidence of the chorea and recovery. One of these women was in a very serious condition when the uterus was evacuated; pulse 120, subdelirium, scarcely any sleep and an eruption resembling measles four days after the abortion.

A fatal outcome may be feared when the choreic movements are extremely severe, preventing eating and sleep and not yielding to sedatives; when mental disturbances precede or accompany the chorea; when the pulse and temperature run up, and there is a morbilliform eruption. Interruption of the pregnancy when this stage is reached is of little use but cannot be refused as a last resort.

37. Diabetes and Pregnancy.—Fruhinsholz has noticed that the children of diabetic women are liable to be large but they die either during delivery or in three or four days thereafter. There are other analogies with syphilis; both entail an "inaptitude for life" although the new-born child may be large and appear to be healthy. Women should be examined for both syphilis and diabetes when the fetus dies near term or at or soon following delivery. On the other hand, diabetes does not entail abortion so regularly as syphilis, and while therapeutic measures may have a decided influence in restoring conditions practically to normal in case of syphilis, with diabetes the circumstances are not so favorable. It seems impossible to act favorably on the fetus of a diabetic woman by any treatment given her. He insists consequently that diabetic women should be warned against conception. A pregnancy is almost certain to aggravate the diabetes, while there is little hope of a healthy offspring. The child is almost inevitably doomed to die at or almost immediately following its birth.

Archives des Maladies de l'App. Digestif, Paris

July, VII, No. 7, pp. 361-420

38 Occult Hemorrhage in the Stomach or Intestines. (Critique expérimentale de differents procédés en usage pour la recherche des hémorragies occultes du tube digestif.) G. L. Hallez. Concluded in No. 8.
39 *Hereditary Nature of Gastric Ulcer. F. Dauwe.
40 Perforation of Gastric Cancer: Twelve Cases. Jalsson.

39. Heredity of Gastric Cancer.—Dauwe reports eight cases in which the father or mother of the patient had also had ulceration in the stomach at some time. The tendency to recurrence, to excessive gastric secretion, and the development of the ulcer at an early age are special features of these hereditary cases. A hereditary tendency was evident in about 25 per cent. of all his gastric ulcer cases. Accepting a peptic origin for the cancer, and accepting a primary hypersecretion as responsible for the peptic corrosion, the gastric ulcer is thus traced to an indirect nervous origin, which readily explains any hereditary tendency.

Archives de Médecine des Enfants, Paris

August, XVI, No. 8, pp. 561-640

41 *Spastic Paraplegia in Inherited Syphilis. A. B. Marfan.
42 *Influence of Heat on Puppies. G. Schreiber and H. Dorlencourt.
43 Cancer in Mediastinum in Child of 13. J. Hallé and H. Salin.
44 Static Ataxia as Early Sign of Tuberculous Meningitis. (Les troubles de l'équilibration dans la méningite tuberculeuse.) A. d'Espine.
45 *Epilepsy in Children. J. Comby.

41. Spastic Paraplegia in Older Children Due to Inherited Syphilis.—Marfan describes a form of spastic paraplegia for which inherited syphilis is responsible. In the first case of the kind he encountered (1894) it developed slowly and progressively in a boy of 8, and a syphilitic origin was suspected but no benefit was derived from specific treatment. In several of the six cases he reports the Wassermann reaction was positive. Left untreated, this heredosyphilitic paraplegia continues an inexorably progressive course, and when the lesions have been long installed the destruction wrought is irreparable. In his first case no benefit was derived from either mercury or iodid. After the discovery of salvarsan, he began to treat this patient with it, and this has apparently arrested the progress of the disease as it has been stationary since.

If treatment is commenced in the early stages of the paraplegia, there is every prospect of its arresting the progress and possibly realizing a complete cure.

On account of the hopefulness of early treatment and the slight chance of influencing the paraplegia after serious lesions are once installed, the early recognition of the condition is of extreme importance. It should be suspected whenever a child limps or shows any other disturbance in his gait. The paraplegia commenced in all his cases between the ages of 5 and 12. At first merely a very slight limp, the trouble beginning insidiously and slowly progressing until after a year or year and a half the child was unable to walk to school. The gait is of the spastic type; the child drags his feet, not lifting the toes, and he balances from left to right and right to left at each step. At first the disturbance may be more pronounced on one side. The legs are held stiff and lifted up all in one piece, the child finding it difficult or impossible to bend the hip, thigh and ankle. This difficulty in flexing the joints is the main disturbance in the gait. There is also a tendency to pes equinus and varus or valgus and the knees knock together. This spastic rigidity is scarcely appreciable when the child is seated or reclining. The legs are slightly rotated inward, with adduction, but they can be moved easily and the joints flexed except that as the foot is passively flexed upward the Achilles tendon may oppose a fibrous resistance.

The muscles are not weak nor hard nor atrophied, and the spastic rigidity of the legs is accompanied by only very slight paresis. But even in repose the tendon reflexes are seen to be much exaggerated and there is epileptoid trembling of the foot. Rubbing the front of the leg or tickling the sole induces the Babinski sign. The electric responses are normal or nearly so, and there are no sensory disturbances, no pains, no atrophy or weakness of the muscle. By the end of ten years in his first case the patient was then 18, and was unable to walk unless supported by another person, but the affection had not changed its character in any way; there were still no sensory or sphincter disturbances and no atrophy of muscles. Another differential point is that there are generally the pupil signs characteristic of syphilis. In three of his six cases there was interstitial keratitis and two of the children were mentally backward. Marfan discusses the pathologic changes in the spinal cord probably responsible for the paraplegia, but has had no opportunity to examine a case post mortem.

42. **Cool Baths in Excessive Heat.**—Schreiber and Dorlencourt tabulate some statistics which confirm anew the way in which babies die on days of excessive heat or the day after. They then report extensive research on puppies exposed to high temperature as in the summer heated term. The results confirm the directly injurious exclusive action of the high temperature, and that it is proportional to the height of the temperature. Both the naturally fed and the artificially fed suffered alike. Humidity in the air seemed to reduce the resisting powers. The puppies kept at 30 to 37 C. (86 to 98.6 F.) developed fever, with dyspnea and they lost flesh and were very restless. At 50 C. (122 F.) there was actual heat stroke, speedily fatal, but no digestive disturbances were noted. All the puppies died kept at a temperature of 40 C. (104 F.). In one series of experiments, artificially fed puppies had in addition to the other symptoms digestive disturbances, with diarrhea in two and vomiting in one. On the other hand, they found that cool baths had a marked influence on the overheated puppies, the temperature and the respiration returning to normal almost immediately. Even with pronounced heat stroke, the cool bath corrected conditions so that the puppy did not show any ill results from his experiences. The experiments all teach, they declare, the importance of immediate cool baths for infants suffering from the excessive heat, applying the baths extensively and energetically.

45. **Epilepsy in Children.**—Comby thinks that epilepsy is often acquired from some preventable cause. It is not a hereditary neurosis and hence should not be regarded as an inheritable taint. The ostracism of a family with an epileptic member, he declares, is based on misapprehension. Epilepsy is generally regarded as hereditary and incurable when in fact it is neither. In its various degrees it is common in children but it is rare in adults and extremely rare in the elderly. This can mean only that the children outgrow the tendency in time. Some comparatively insignificant obstetrical trauma is responsible for epilepsy later in many cases, he is convinced. The traumatic lesion may be so minute that it escapes the closest examination, but yet it is enough to bring on epileptic seizures while it does not manifest its existence in any way during the intervals. The effect of this obstetrical trauma, however, cannot be regarded as in any sense an inherited affection.

All the evidence to date is in favor of the assumption that there is always some lesion at the bottom of the epilepsy; it is not a neurosis but an organic affection of the nervous system. The lesion may have been acquired during intrauterine existence, but aside from the obstetric cases it is usually acquired after birth, and there is almost invariably a history of some more or less severe infectious disease affecting the brain. In some cases an accidental intoxication makes an impression on the brain enough to stamp it with the taint of epilepsy. He relates a case of this latter kind: A child of 3 slept in a room with a defective flue letting coal gas escape. After a winter of this he developed epileptiform attacks. They subsided during the summer, but after another winter of the coal gas he became a confirmed epileptic and the seizures have recurred regularly during the nine years since. The carbon monoxid evidently induced an acute and localized encephalitis which in its turn generated the epilepsy. In other cases Comby has known hemiplegia to follow coal-gas poisoning. Epilepsy consequently, he insists, is the result either of traumatic (obstetrical, etc.) origin, or it is due to encephalitis accompanying an acute infectious disease, or it is the result of the action of some poison.

Journal de Médecine de Bordeaux

August 10, LXXXIV, No. 32, pp. 511-524

46 Mechanism of Fracture of Lower Third of the Leg. (Du mécanisme en général des fractures du tiers inférieur de la jambe.) P. Bouvier.

Journal d'Urologie, Paris

August, IV, No. 2, pp. 169-340

47 *Removal of Bladder for Tumors. (De la cystectomie totale dans les néoplasmes multiples ou infiltrés de la vessie.) P. Héresco.
48 *The Nitrogen Output in Heart and Kidney Disease. (Le coefficient azoturique de l'urine dans les affections rénales et les cardiopathies.) J. Bret and R. Boulud.
49 Transformation of Cystic Cystitis into the Glandular Form. J. François.
50 *Why the Prostate Causes Symptoms. (Pathogénie de Prostatisme.) W. Deton.
51 *Treatment of Acute Epididymitis. (Sur les nouveaux traitements des épididymites aigues blenorragiques et en particulier de leur traitement par le sérum antimeningococcique.) E. Schmutz.

47. **Removal of the Bladder on Account of Multiple Tumors.**—Heresco comments on the gravity of the clinical outlook with the bladder filled up with a new growth, and also on the gravity of total cystectomy. But his experience with four cases in which he removed the entire bladder and sutured both ureters to the skin at the point of the incision has proved that this operative treatment may prove unexpectedly satisfactory. By bringing the mouths of the ureters close together in the hypogastric region one urinal suffices for both, and is easily managed by the patient. It permits also direct disinfection of the kidney pelvis on both sides. A long catheter is run into each ureter thus conveying the urine into the urinal which may be strapped to the leg. One of his four patients was a woman and she neglected to keep up the sterilizing injections into the kidney pelvis as instructed, and she succumbed ten months later to pyelonephritis. The trouble was a cancer in one of the other cases and this patient also succumbed after a few months to the progress of his malignant disease. But the two other patients are still in good health, one after more than two years, the other nearly as

long. The prostate is normal in both, the ureters permeable and the general health excellent. They were men of 50 and 45. The first had a diffuse infiltrated cauliflower-like cancroid nearly filling the bladder; the tumor in the second case so filled the bladder that even the finger could not be introduced. In this latter case the patient refused to allow the entire bladder to be removed until after two palliative operations. The final cystectomy was difficult and took an hour and a half and the postoperative weakness was extreme; only 100 gm. of turbid urine were voided in the following twenty-four hours. This amount slowly increased but the patient was tormented with singultus and vomiting two or three days and there was slight fever, but then the man began to improve rapidly as the kidney pelvis was rinsed out with a disinfectant three or four times a day for two weeks. This is almost the only technic for cystectomy which readily permits this repeated systematic disinfection of the kidney pelvis on both sides, and yet it is to this that the ultimate favorable outcome is due in large measure. Heresco found it an advantage to drain through the perineum after the cystectomy, and he also emphasizes the necessity for working the ureters loose as far up as possible before fastening them to the skin. Seven illustrations accompany the article.

48. **The Nitrogen Output in the Urine in Kidney and Heart Disease.**—Boulud states that study of additional cases with the necropsy findings has confirmed in every respect his statements in regard to the clinical and diagnostic importance of the index of the proportion of nitrogen in the urine. They were summarized in The Journal, 1912, lix, 1751. He now has a record of forty cases and he gives the details of each, with the post-mortem findings, and draws some general laws based thereon which throw light on the pathologic conditions of which the "azoturic coefficient" is one of the manifestations.

50. **Why the Prostate Causes Symptoms.**—Deton emphasizes that besides the loss of elasticity in the prostate and its enlargement, elderly people have to contend in addition with a reduction in the expelling force of the bladder. This latter factor should not be overlooked in study of "prostatism."

51. **Antimeningococcus Serum in Treatment of Acute Gonorrheal Epididymitis.**—Schmutz reviews the various measures in vogue for treating the complications of gonorrhea, particularly epididymitis, and relates extensive experience in his own and others' practice with antimeningococcus serum, particularly in France and Roumania. The serum is generally injected into the muscles of the thigh and three injections are usually sufficient. The spontaneous pain is the first symptom to subside under this serotherapy, the patients sleep well after the first night and the epididymis becomes less sensitive. The temperature drops the day after the injection as a rule, and the superficial inflammation loses its angry aspect. The deep tissues do not show much benefit until after two or three days, when the swelling of the parts begins to go down. The effusion in the vaginalis noticed in nine of fifty cases was all absorbed, and in some instances in forty-eight hours. By the tenth day the epididymis was soft throughout, except possibly for a tiny bunch still hard but not tender, and there is every reason to suppose that this will be absorbed in the course of time. In five of the six patients reexamined later, the epididymis was apparently normal in every respect but the sixth still had the tiny hard lump, probably retrogressing at the time. Schmutz therefore concludes his review by commending as superior this method of treatment; the only contra-indications, he says, are possible anaphylaxis, from preceding serotherapy, and mixed infection, which may annul the effect of the serotherapy.

Lyon Médical, Lyons

August 3, CXXI, No. 31, pp. 181-220

52 Intestinal Complications with Pulmonary Tuberculosis: Improvement after Radical Operation and Salvarsan. (Tuberculose iléo-caecale hypertrophique chez une Tuberculeuse pulmonaire.) Santy and L. Durand.
53 Chorio-Epithelioma. A. Pollosson and Violet. Commenced in No. 30.

August 10, No. 32, pp. 221-260

54 Syphilitic Aortitis with Symptoms of Insufficiency of the Left Ventricle. L. Gallavardin.

August 17, No. 33, pp. 261-296

55 Detachment of the Retina Improved by Simple Sclerectomy. L. Aurand.

August 24, No. 34, pp. 297-328

56 Advantages of the Phenolsulphonephthalein Test of Kidney Functioning. G. Mouriquand.

Presse Médicale, Paris

August 16, XXI, No. 67, pp. 677-684

57 The Laws of Physics Applied to Chemistry. (Le deuxième principe de l'energétique et la chimie.) H. Guilleminot.
58 The Nitrogen in the Urine. (Métabolisme azoté urinaire.) L. Lematte.

August 20, No. 68, pp. 685-692

59 Serodiagnosis of Undulant (Malta) Fever. (Valeur de l'agglutination du micrococcus melitensis par le sérum sanguin, en particulier chez les chèvres.) Martel, Tanon and Chretien.
60 Improved Technic for Thiersch Flaps. (Quelques modifications à apporter à la technique des greffes d'Ollier-Thiersch.) P. Hardouin.

August 23, No. 69, pp. 693-704

61 Therapeutic Reflexes in the Large Intestine. (Contractions réflexes du gros intestin et réflexothérapie.) H. Lebon and P. Aubourg.
62 Cultivation of the Syphilis Spirochete and Skin Test. (La culture du spirochète pâle et la cuti-réaction dans la syphilis.) R. Burnier.
63 Improved Technic for Therapeutic Application of Radium. E. Vallet.

Revue de Gynécologie, Paris

XX, No. 6, pp. 545-640

64 *Diagnosis of Extra-Uterine Pregnancy. (Grossesse extra-utérine.) M. Chaput.
65 *Retroperitoneal Cysts Originating in Wolffian Body. (Kyste wolffien du mésocolon descendant.) C. Jacquot and C. Fairise.

64. **Diagnosis of Extra-Uterine Pregnancy.**—Chaput reports a case in which there was no sign of intraperitoneal hemorrhage, no hematocele anywhere and no disturbance in menstruation, but the diagnosis of extra-uterine pregnancy was rendered certain by attacks of intense pain, in the region of one ovary, the recurring paroxysms of pain being separated by intervals of entire freedom from pain. The paroxysms recurred unmodified by any and all measures to relieve the pain. In a second case there was a hematocele lying like a cap over the top of the uterus and not accessible to palpation through the vagina.

65. **Retroperitoneal Cysts Originating in Wolffian Body.**—Jacquot and Fairise report the details of a case in a girl of 18 with the minute necropsy findings and review thirteen other cases from the literature. The age of the patients ranged from a few months to 65 years. The embryonal origin entails a tendency to a malignant evolution while the complications of the tumor may prove directly fatal. Seven pages of bibliography are given and the necessity for prompt operative removal of such cysts is reiterated in conclusion.

Revue Mens. de Gynécologie, d'Obstétrique et de Pêdiatrie, Paris

July, VIII, No. 7, pp. 425-464

66 Spina Bifida and Pregnancy. (Spina bifida et puerpéralité.) R. Gilles.
67 Electric Devices for Applying Moist Heat in Gynecology and Abdominal Surgery. (De l'emploi des compresses chauffantes électriques en gynécologie et en chirurgie abdominale.) R. Riss.

Semaine Médicale, Paris

August 27, XXXIII, No. 35, pp. 409-420

68 *Retention of Salt in Kidney Disease with Dropsy with Subnormal Salt Content of Blood. (Rétention chlorurée hypochlorémique dans les néphrites hydropigènes.) C. Achard and A. Ribot.

68. **Retention of Sodium Chlorid with Subnormal Content in the Blood.**—Achard and Ribot give a number of examples to show the variable effect of the ingestion of salt on the proportion eliminated in various diseases. In one of their cases a man with chronic interstitial nephritis, the kidneys impermeable to urea, with retention of nitrogen and extensive

edema, yet had only from 4.3 to 4.5 gm. of sodium chlorid per thousand in the blood-serum. In a second case a tuberculous young man with acute nephritis and dropsy had only 5.1 gm. per thousand of the chlorid in his blood-serum and two weeks later this dropped to 4.56 gm. In the peritoneal effusion, however, the proportion even with this latter figure was 5.1 gm., while the percentage of urea was practically the same in both serum and ascitic fluid. These facts and others related suggest that in the retention of salt in kidney disease hitherto unsuspected extrarenal factors are involved. These factors must evidently be sought in the tissues themselves and in the organic fluids.

Archiv für Gynaekologie, Berlin

C, No. 1, pp. 1-231. Last indexed July 5, p. 67

69 Relation of the Ovum to the Follicle Apparatus and of the Corpus Luteum to Menstruation. (Zur normalen und pathologischen Anatomie und Physiologie des Ovariums.) R. Meyer.
70 Ovulation, the Corpus Luteum and Menstruation. C. Ruge. II.
71 Anatomic Findings in Carcinomas after Exposures to Mesothorium and the Roentgen Rays. P. Haendly.
72 Familial Chondrodystrophy. G. A. Wagner.
73 The Clinical Status of Cancer of the Body of the Uterus. W. Weibel.
74 Placental Bacteremia. Warnekros.
75 Technic for Preventing Peritonitis after Operative Treatment of Rupture or Perforation of the Uterus; Eleven Cases. W. Sigwart.
76 The Hist[illegible] Uterine Tumors. (Ueber histologische [illegible] im Bereiche der Gebärmutter.) J. Schottlaender.

Beiträge zur klinischen Chirurgie, Tübingen

LXXXV, No. 1, pp. 1-238

77 Transplantation of Phalanx from Toe into Left Ring Finger. (Freier autoplastischer Phalangentausch in einem Fall von Riesenzellensarkom der Mittelphalanx des linken Ringfingers.) R. Sievers.
78 Tuberculin Treatment of Surgical Tuberculosis. H. Meyer.
79 Roentgenoscopic Diagnosis of Disease and Adhesions of the Large Intestine. (Zur Roentgendiagnostik der Dickdarmerkrankungen, speciell von Verwachsungen an demselben.) A. Welter.
80 Volvulus of the Large Intestine. E. Bundschuh.
81 *Ivory Prothesis Implants, with Screw-Thread, in Bones and Joints; Eight Cases. (Ueber die Implantation von Elfenbein zum Ersatz von Knochen- und Gelenkenden.) F. König.
82 Resection of Ileocecum for Invagination from Submucous Lipoma. K. Andrée.
83 Enchondroma of the Spine. B. Valentin.
84 *Splenectomy for Splenomegaly with Severe Anemia. (Zur Lehre vom Morbus Banti.) Grützner.
85 *Fascia Flaps and Implants. (Die freie Fascientransplantation.) P. Kornew.

81. **Ivory Supports after Resection of Bone.**—König says that tissue grows into an ivory implant in time, fastening it firmly and thus curing pseudarthrosis and similar aseptic lesions ideally. In an infected focus it does not heal in place so well and is liable to maintain the characteristics of a foreign body. He reports extensive experimental and clinical experience with eighty cases, profusely illustrated. Cutting a screw-thread and numerous small depressions in the ivory helps in its solidity after healing. In one of the cases an ivory artificial humerus was implanted; it locked in the shoulder joint and the lower end cut to a point set rigidly in the short stump of the patient's own humerus below. Sometimes he uses wire to hold the ivory implant in place. Eighteen illustrations accompany the article, including two of a woman of 68 whose left lower jaw had been replaced with an ivory prothesis which looks and works like a normal jaw and causes no disturbance.

84. **Splenomegaly with Anemia.**—Grützner's patient was a girl of 10 who had had rachitis and was under treatment for helminthiasis when the spleen began to enlarge and signs of a hemorrhagic diathesis followed, with progressive anemia threatening to prove speedily fatal unless something could be done to arrest it. The syndrome suggested Banti's disease but had not lasted long enough for cirrhosis of the liver and ascites to develop. The blood picture began to improve at once after the splenectomy and by the fifth day the reds had doubled in numbers and soon reached the normal figure. The blood picture has persisted normal during the year since. The spleen measured 19x12x4.5 and weighed 450 gm.

85. **Fascia Grafts.**—Kornew's article is based on both experimental and clinical experiences and fills ninety-four pages. Grafts of fascia heal finely in place, he states, irrespective of their size. A fascia graft is peculiarly useful to close gaps in the bone and muscle wall of the thorax and defects in the pleura. Also to reenforce hernia operations, a sheet of fascia having superior advantages for this purpose over all other methods. A fascia flap is often likewise the best means to close a defect in the abdominal walls, and is the method of choice for closing the internal femoral ring. A strip of fascia is also the best means to draw up the anus in treatment of prolapse of the rectum. Also for fixation of the testicle in case it rides up. Mobilization of the ankylosed mandibular joint is also possible with the aid of a fascia implant; in fact, this is by far the simplest and most effectual method for the purpose.

Berliner klinische Wochenschrift

August 18, L, No. 33, pp. 1509-1552

86 *Intestinal Auto-Intoxication. A. Albu.
87 *Beriberi. (Weiteres zur Beriberifrage.) W. Caspari and M. Moszkowski.
88 Radiotherapy of Tumors. (Zur Strahlentherapie der Geschwülste.) S. Loewenthal.
89 Comparison of Technics for Serodiagnosis. (Die Hermann-Perutz'che Reaktion im Vergleich zur Wassermann'schen Reaktion.) F. Bräutigam.

86. **Intestinal Auto-Intoxication.**—Albu reviews the present conceptions in regard to auto-intoxication from the intestines, and states that the new biochemical facts recently learned in regard to the internal secretions, hormones, etc., make it necessary to revise the conception of this subject on this new basis. Only when these newly acquired biochemical data are duly taken into consideration will the theories conform to the facts.

87. **Beriberi.**—Caspari and Moszkowski have been studying this subject for years and here relate the findings in metabolic research on Dr. Moszkowski extending over a period of 230 days, during which the main article in his diet was polished rice. In the course of time symptoms developed suggesting the cardiac form of beriberi. Positive experiments on pigeons and animals were conducted at the same time. In the pigeons, as also in the case of Dr. Moszkowski, all the symptoms subsided in an amazingly short time when small amounts of an extract of rice bran were given in addition to the previous diet. The metabolic findings showed in the course of the experiment great destruction of albumin, to be explained only as the result of severe intoxication.

There can be no doubt, they say, judging from these experiences, that beriberi is not the result of a deficiency in the diet but of some toxic plus, and thus it is essentially an intoxication. They think that the last link in the chain of evidence is provided by one of their numerous experiences: Pigeons were fed for months on hens' eggs with a little salt and sugar. The birds thrived and were in excellent health. Then some polished rice was added to the egg, and the pigeons every one developed polyneuritis after a longer or shorter interval while the controls remained healthy. The toxic substance causing the beriberi is not necessarily present in the food, they say; it may originate in the body under the influence of the polished-rice diet. This assumption is confirmed by the beneficial influence of purgatives which Abderhalden and Lampé have reported as almost constant in their research on polyneuritis in swine.

Correspondenz-Blatt für Schweizer Aerzte, Basel

August 16, XLIII, No. 33, pp. 1025-1056

90 *Therapeutic Compression of the Lung; Artificial Pneumothorax and Thoracoplastics. (Ueber Lungenkollapstherapie.) L. Spengler (Davos).
91 Thucydides' Plague probably Exanthematous Typhus. (Die Seuche des Thukydides.) F. Kanngiesser.

August 23, No. 34, pp. 1057-1088

92 Cases of Tuberculosis Adapted for Sanatorium Treatment. (Die Auswahl der Lungenkranken für die Heilstättenkur.) R. Dietschy.
93 *The Horsehair-Worm as Parasite of Man. (Gordius als Parasit des Menschen.) H. Herzog.

90. Compressive Treatment of the Lungs.—Spengler has had extensive experience with both artificially induced pneumothorax and operations to mobilize the chest wall and thus induce the compression of the lung. He tries to induce the pneumothorax first; only when this fails does he attempt the thoracoplastic operation. He gives the history of both operations and describes his technic and the indications for each. He has been able to trace to date all but five of the ninety-three patients he has treated with the therapeutic pneumothorax. Twenty-three, that is, 26 per cent., are clinically cured of their pulmonary tuberculosis; 41 per cent. have not quite completed the course, but the improvement to date is very encouraging. In only 21 per cent. was the desired result not realized, and in most of these cases the conditions prevented a complete pneumothorax. Thus favorable results were realized in sixty-nine of the eighty-eight, namely, in over 78 per cent. In eighteen other cases the chest wall was resected; the patients were thereby cured of their pulmonary disease in four cases and materially improved in twelve others; two died, one from the effect of the operation itself, the other from aspiration complications. Sauerbruch has a record of fifty-six cases of this kind without perforation of the cavity and twelve of the patients were cured, seventeen materially improved and fifteen improved, while the condition seemed to grow worse afterward in four cases and two patients died from the effects of the operation and six have died since from the progress of their disease. In ten cases in which the cavity had perforated, four were materially improved or cured and one is still under treatment; the others have died. This group includes three recoveries although the empyema had perforated into a bronchus or into the artificial pneumothorax. The cases with tendency to shriveling of the lung tissue are particularly adapted for the thoracoplastic technic, especially when the shriveling process is so pronounced that the trachea has been drawn to one side and there is some dyspnea. In two of Sauerbruch's cases of this type the dyspnea subsided after the plastic operation. The lower lobe must be compressed first.

93. Horsehair-Worm as Human Parasite.—Herzog reports a case in which the description of the worm passed in the stools seemed to agree with the description of the gordius, and a second case in which the worm was absolutely identified as the gordius. It was expelled in the stool of a boy of nearly 3, in company with several specimens of the oxyuris. He says that it is the nineteenth authentic case on record. The child had been nervous for a few weeks, complaining of abdominal pain and waking up screaming at night, but the appetite and stools were apparently normal except that five weeks before the gordius was expelled there had been blood in the stools. Whether the gordius or the oxyuris was responsible for this is a question. The child since the expulsion of the worm has been in constantly good health.

Deutsche medizinische Wochenschrift, Berlin

August 14, XXXIX, No. 33, pp. 1577-1624

94 *Pernicious Malaria. E. Marchiafava (Rome).
95 *Influence of Roentgen Rays on Experimental Pulmonary Tuberculosis. L. Küpferle and A. Bacmeister.
96 Serodiagnosis of Tuberculosis. (Anwendung des Dialysierverfahrens—nach Abderhalden—bei der Tuberkulose.) E. Fränkel and F. Gumpertz.
97 *Goats Born and Brought Up in Strictly Aseptic Conditions. (Die Gewinnung und Züchtung keimfreier Säugetiere.) E. Küster.
98 Anatomy of Nerves of Lacrimal Secretion and of Taste. (Verlauf der sekretorischen Fasern zur Tränendrüse und der Geschmacksfasern.) Blum.
99 Examination of Heart of Wrestlers. (Röntgenologische Herzgrössenbestimmungen an Ringern.) L. Katz and M. Leyhoff.
100 Hydrotherapy of Pulmonary Tuberculosis. F. Köhler.
101 Cesarean Section for Premature Separation of Normally Located Placenta. (Kaiserschnitt bei vorzeitiger Lösung der regelrecht sitzenden Nachgeburt.) F. Spaeth.
102 Psoriasis a Symptom of Constitutional Bacterial Disease. A. A. L. Menzer.

94. Pernicious Malaria.—Marchiafava comments on the wonderful improvement realized in recent years in the campaign against malaria in Italy, especially in the extensive marshes around Rome. Scarcely a week passed in the old days without the necropsy of one or more cases of pernicious malaria at the San Spirito hospital, but last year, up to August 15, there had not been a fatal case. Cases of pernicious malaria still develop, however, in the malarial districts and he emphasizes the fact that persons acquiring malaria for the first time seem to be peculiarly prone to develop the pernicious type. This fact is sustained not only by the history of the cases—the sufferers are generally persons just arriving in the district—but also by the fact that the spleen in his cases of pernicious malaria was not much enlarged and the congestion and enlargement were evidently of quite recent date. The appearance resembles that of the spleen in typhoid fever, differing only in the melanosis and the extreme softness. In all his experience he never found the spleen chronically enlarged in a case of pernicious malaria. By the time the individual has developed the chronic enlargement of the spleen he has had time to become practically immunized against the pernicious type of the malarial infection.

In the pernicious form quinin fails as a rule because the parasites are in such numbers and probably extremely virulent; even if they are all destroyed by the quinin the organism is flooded with toxins to an extent incompatible with survival. The only dependence can be on prophylaxis, and he reiterates the importance of this. Every workman or other person going to a malarial district for the first time should be compelled to apply for the quinin preventive treatment the very first day of his arrival and should be instructed in the methods of prophylaxis without a day's delay. The pernicious type seems to be the work of the estivo-autumnal form of the malaria parasite and the thick-film method is particularly fine for showing them up. Marchiafava adds that examination of the blood should be a routine procedure in all malarial regions whenever there is persisting fever assuming typhoid characteristics; also in all cases of jaundice with more or less fever; in children with symptoms suggesting meningitis, and in diarrhea suggesting cholera, accompanied by fever. In this way it will be possible to detect the cases of pernicious malaria possibly in time for treatment to prove effectual. Examination of the blood is not necessary in cases of unmistakable malaria.

95. Roentgenotherapy of Pulmonary Tuberculosis.—Küpferle and Bacmeister have been conducting experimental research on rabbits with financial aid from the Koch Foundation, and report that only large doses of the hard Roentgen rays seem to be able to exert a favorable influence on the tuberculous process. The action of the Roentgen rays may be effectually reenforced by other forms of radiant energy, and other measures which resemble them in their action. In none of their experimental work was it possible to destroy entirely the tuberculous process, not even in the incipient cases. The tubercle bacilli themselves did not seem to be directly injured by the Roentgen exposures; animals inoculated with them afterward developed tuberculosis. But the fibrous transformation of the tuberculous tissue under the influence of the rays checks the growth of the tubercle bacilli in the focus and protects against their spread.

97. Aseptic Mammals.—Küster extracted the young of goats by Cesarean section about a week before term and brought them up under absolutely aseptic conditions. The kids developed as normally as the controls. He thinks that the possibility of thus bringing up large mammals under absolutely aseptic conditions opens a new field for scientific research. The kid was kept in an iron and glass box stall. The floor of the stall is funnel-shaped with a paraffin oil siphon to permit the removal of excreta without interfering with the sterility of the box. An aseptic anteroom with double doors contains an electric sterilizing apparatus for the food, etc. A pair of long rubber gloves is fastened germ-tight in the opposite walls of the box stall so that a person in the anteroom can run his arms into the gloves up to the shoulder and use his hands thus inside the stall. Two persons can thus work inside the stall at the same time. The air pumped into the stall is filtered three times through cotton, the last time after it has been passed through concentrated sulphuric acid, after which the air is passed through an electric heater which heats it to 150 C.

The kid is thus kept in germ-free air and fed germ-free food; the great difficulty is to get the sterile kid into the box in a germ-free manner. The Cesarean section and extraction of the kid were done under a gauze tent kept constantly sprayed inside with hydrogen dioxid, the tent opening into the aseptic anteroom so that the kid was passed directly from the uterus to the gloved hands of the assistant in the anteroom. During the procedure the air pump was pushed to the utmost, the current of air thus sweeping through being so powerful that any germs floating in the air must have been carried out. The first kid soon died as both it and the control proved to be non-viable. The carcass dried up and was found bacteriologically sterile when examined after it had been left in the aseptic box for ten days. The second kid was kept in the aseptic box for forty-four days and continued to thrive after its release.

Medizinische Klinik, Berlin

August 17, IX, No. 33, pp. 1317-1358

103 *Dietetic Treatment of Cholelithiasis. (Die diätetische Behandlung der Gallensteinerkrankung.) H. Salomon.
104 *Treatment of Eclampsia. A. Wegner.
105 Mesothorium in Gynecology. W. Sigwart and P. Händly.
106 Limits of Conservative Surgery in Military Campaigns. (Grenzen der konservativen Behandlung in der Kriegschirurgie.) R. R. J. Klapp.
107 The Predisposition a Determining Factor in Diphtheria. (Diphtherie und soziale Lage.) F. Reiche.
108 Vaccine Treatment of Gonorrhea. A. Menzer.
109 *Treatment of Intermittent Limping. (Zur Therapie der Dysbasia angiosclerotica.) J. Pick.
110 Neosalvarsan. (Indikationen und Kontraindikationen der subcutanen Neosalvarsaninjektionen.) J. Fabry.
111 The Ions as Factors in Climate and Therapeutics. (Bedeutung der Ionen als therapeutische und klimatische Faktoren.) P. Grabley.
112 Experimental Research on the Possible Influencing of the Blood-Pressure. A. Selig.
113 *Helminthiasis. (Eine häufige Ursache verschiedenartiger Störungen.) G. Liebermeister.

103. Dietetic Treatment of Cholelithiasis.—Salomon remarks that there are few fields of dietetics in which such diversity of opinions has prevailed as in the management of gall-stone trouble. He adds that we cannot hope to dissolve the stones in the gall-bladder or drive them out into the intestines by any therapeutic means at our command. The best we can do is to keep the bile system healthy. The bile ducts are too small and the pressure of the bile too weak to hope to drive the stones into the intestine by any means to stimulate the production of bile. The presence of gall-stones tends to render the stomach abnormally irritable. This irritability is manifested by the same signs and symptoms which accompany hyperacidity in the stomach. He regards this as even more important than the fact that hyperacidity is frequently encountered with cholelithiasis. The tendency to excessive secretion is felt both in the stomach and in the gall-bladder, and the hypersecretion thus may start up pain from the gall-stones just as a hitherto pain-free felon begins to throb and pain when a wave of blood pours into it.

In any event, he declares, the dietetic management of cholelithiasis during the latent stage should be the same as for hyperacidity. Cold drinks should be carefully avoided; warm drinks may be useful and a little above the usual ration of fluid should be taken, up to 2 liters. Fat is well tolerated, as also in hyperacidity. Purgatives are often directly harmful, especially their chronic use, as also with gastric hyperacidity. The main point, however, in the treatment of both hyperacidity and cholelithiasis is to cure the tendency to constipation. Normal peristalsis of the bowel is unquestionably the best means for promoting the flow of bile. Constipation should be combated by coarse food and fruit; even at the risk of fatiguing the stomach, this dietetic regulation of bowel functioning should be sought as the main desideratum. Gradual and systematic training of the gastro-intestinal canal to proper functioning is the best means to influence the cholelithiasis. Obstinate attacks of pain and fever often disappear promptly and permanently when the constipation has been conquered. This suggests that stagnation of the bile is responsible for the attacks.

104. Treatment of Eclampsia.—Wegner comments on the way in which the principles of Stroganoff's prophylactic treatment are now being adopted in many places. The most important is the shutting out of all external irritation, all noises, bright light, chilliness, unnecessary contact and pain; isolation in a dark room is enforced, the convulsions aborted and kept under control with morphin, chloral and chloroform, delivery hastened but not forced and the respiration and functioning of the heart, kidneys and skin carefully supervised. Stroganoff reports only 7 per cent. mortality in 500 cases of eclampsia treated on these principles. This includes all the cases of sepsis, hemorrhage and pneumonia; the mortality of the children was 21 per cent. That this low mortality is not due to any special mildness of the eclampsia in Russia is shown by other statistics cited from the same city with a mortality of 18 and 20 per cent.

Wegner insists that close medical surveillance is necessary for women with eclampsia and they consequently should be sent to the hospital, the sooner, the better, giving a sedative for the transportation. If the woman has to be treated at home, he advises the Stroganoff method, supplemented by venesection, withdrawing at least 500 c.c. of blood. If delivery can be brought about without force, this should be done under a general anesthetic. He reiterates in conclusion that no fluid should ever be put in the mouth of an unconscious person, and adds that eclampsia without convulsions is usually the severest form.

109. Treatment of Intermittent Claudication.—Pick reports unusually fine results from his treatment of the disturbances of peripheral arteriosclerosis. It is based on the principle of reducing the viscosity of the blood, that is, the internal friction, and promoting the circulation in general by having the patient breathe under negative atmospheric pressure, thus magnifying the pumping effect of the expansion of the lungs. He meets these indications by having the patient inhale an iodin spray, supplementing the action of the iodin on the blood by means to impede to a certain extent the intake of air into the lungs. He brings the iodin spray into an air-tight mask with valve arrangement which does not permit quite free breathing but allows unimpeded expiration. The result is physiologically identical with that of breathing under negative atmospheric pressure. The patient has to make greater efforts to breathe to get enough oxygen in addition to the spray he is inhaling. When this combination of iodin and under-pressure breathing is applied repeatedly every day for several weeks, the patients find that they can walk without the intermittent attacks of inability to use the limb in question; the pulse becomes perceptible in the region once more and the limb feels warm. This warmth is felt over the whole body, showing that the effect on the circulation is general.

Patients with peripheral angiosclerotic dysbasia do not suffer from the intermittent disturbances so often or so severely when they are climbing a hill as when they are walking on level ground. Walking up hill is more exertion and they breathe deeper, thus promoting the circulation throughout. Pick trains his patients to walk and move generally more slowly; this postpones the vascular disturbance from the muscular exertion. Otherwise the lack of adequate oxidation and the accumulation of metabolic waste bring on such acute fatigue that inability to functionate follows. A few moments' rest, however, and the fatigue waste products are swept along and the conditions return to approximately normal. One patient came to him saying that he suffered from intermittent claudication in a severe form and had not been able to feel the pulse in his left foot for six years. He had consulted nearly every prominent physician in the country without relief. After four months of treatment with the iodin spray and the impeded breathing exercises to induce negative pressure in the chest, his leg felt warm, the pulse in the foot had returned and he scarcely ever had any further disturbance in his gait. He is still zealously keeping up the treatment, amazed at the benefit in the four months to date.

113. **Frequent Cause of Intestinal Disturbances.**—For the last two years Liebermeister has had the first stool examined of each patient admitted to the internal department of the Düren public hospital in his charge, and states that among the last 100 patients, twenty-one had ascarides' ova in their stools. In some previous series the proportion was still higher. In a number of the cases the disturbances on account of which the persons had been admitted to the hospital were directly dependent on the helminthiasis and as soon as this had been cured, they were restored to health. One obese woman required an emergency operation for incarcerated hernia and ileus; the hernia was corrected but the general condition was so bad that the ileus was left unmolested; necropsy revealed that a twisted mass of innumerable ascarides in the ileum was the cause of the obstruction. A lad of 13 had ileus and a large tumor could be palpated but under internal measures both subsided but returned two days later. The stools contained numerous ova of ascarides and two courses of treatment for helminthiasis led to expulsion of twenty-five ascarides and restoration to complete health. A third example of the evil for which helminths may be responsible was a woman of 30 who had been treated for a long time for "gall-stone colics" and was finally sent to the hospital for an operation. The discovery of ascarides' ova in the stools led to postponing of the operation until after a course of treatment for the helminthiasis, but this cured at one stroke the whole trouble.

He adds that in seven of the twenty-one patients with helminths in his last hundred, the helminths were responsible for all the morbid manifestations as the latter disappeared entirely under the dose of fourteen drops oil of chenopodium with one drop oil of peppermint, divided into three capsules. One capsule is taken each hour and a powerful purge four hours after the last capsule. Four days later he has the stool examined again and if ova are still found he repeats the course. More than two courses are rarely necessary, but in one case he repeated this treatment eight times, alternating santonin with the oil of chenopodium and more than fifty ascarides were expelled. Even then ova were still encountered in the stools. Liebermeister entitles his communication "A Frequent Cause of Various Kinds of Disturbances."

Münchener medizinische Wochenschrift

August 19, LX, No. 33, pp. 1809-1864

114 The Sense of Touch. (Einiges über den Tastsinn.) A. Basler.
115 *Pathology of the Adrenals. K. Helly.
116 *Endemic Goiter. (Studien über den endemischen Kropf.) T. Dieterle, L. Hirschfeld and R. Klinger.
117 Two Years' Experience with the Wassermann Test. F. Wesener.
118 Liver of Tuberculous Guinea-Pigs and Cattle as Antigen for the Wassermann Test. L. Bitter.
119 *Addison's Disease and Pregnancy. E. Vogt.
120 *The Danger in Combining Morphin with Anesthetics and Hypnotics. (Ueber die Gefährlichkeit der Kombination von Morphin mit allgemeine Narkose und mit Schlafmitteln.) W. Straub.
121 *Case of Fatal Poisoning of the Blood from Aurum •Kalium Cyanatum. (Ueber tödliche Wirkung des Aurum Kalium Cyanatum als Blutgift beim Menschen.) L. Hauck.
122 Electric Treatment of Sciatica. (Zur Behandlung der Ischias.) Schurig.
123 *Seasickness and Vagotony. Friedländer.

115. **Pathology of the Adrenals.**—Helly reports a case in which, as in Kolisko's recently published case, a tumor found in an adrenal was the only probable explanation for the sudden death after a minor operation, merely pulling a tooth in Kolisko's case. In Helly's case the woman of 43 had a tendency to hypertrophy of the heart, high blood-pressure and glycosuria, and he is inclined to regard the tumor found in the adrenal as the direct primary cause for them all. The excessive functioning of the adrenal entailed by the tumor growth—which consisted of chromaffine elements—flooded the organism with epinephrin and this rendered the heart, etc., so unstable that it was unable to resist even the slight shock of a minor operation. Conditions are similar to those in the thymicolymphatic habitus in which sudden death is liable to occur from slight causes. It does not seem possible at present to detect this over-production of epinephrin and the consequent reduction of the resisting powers under its influence, but the discovery of these tumors in the adrenals throws light on certain puzzling cases of sudden death.

116. **Endemic Goiter not Due to the Drinking Water.**—This communication from the hygiene institute at Zurich embraces the results of examination of conditions in regard to the drinking water in fourteen different localities with over 5,600 examinations of individuals residing there. In some of the places the entire population was personally examined. In one town with a population of 693, 61.6 per cent. were found to have goiter; in one with 60, 77 per cent. were affected; one with 195 had 67.7 per cent. The proportion ranged in six towns from 40 to 77 per cent.; in three from 24 to 35 per cent.; in four from 1 to 12.1 per cent. No special geologic formation could be found in these endemic foci, and the drinking water cannot be incriminated as the cause for the goiter, as the distribution of goiter did not correspond to any special type of geologic formation. The endemic foci where goiter had been supposed to have been exterminated by utilizing water from another source, bringing it from a distance, have not shown any diminution of the incidence of goiter as the years pass. The investigators encountered numerous families in which nearly every member had goiter and other neighboring families in which all were free from it. They add that Bircher's statements as to the source of the water supply in certain localities were based on mistaken premises. Renewed investigation showed a different geologic formation than he had supposed.

Goiter is not known to occur spontaneously in rats at Zurich, but the investigators were able to induce it at will by taking the rats to the endemic foci, whether the animals were given the natural water to drink or the water was boiled for them, or they were not given any water or only water brought for them from Zurich. The research carried on with the rats at eight different endemic foci gave positive results in from 40 to 70 per cent. of all the experiments. The nature and origin of the water given the rats to drink had no influence on the outcome. Rats kept at Zurich and given water brought from endemic foci at first did not develop goiter but later there were a few instances of its occurrence; contact infection could not be excluded in these cases. In the endemic foci the animals developed the goiter even when they were given only water from non-goitrous regions.

119. **Addison's Disease and Pregnancy.**—Vogt comments on the far greater prevalence of Addison's disease in men than in women, and states that there is no case known of a woman with primary Addison's disease becoming pregnant and only two instances of pregnancy in secondary Addison's disease. One was reported by Barlow: a woman of 42 who had gummatous tumors in the adrenals and secondary Addison's disease bore a dead child. The other case was reported by Jacquet; pregnancy seemed normal and terminated in the birth of a viable child. After the childbirth the symptoms of Addison's disease improved to a notable extent. Vogt adds a third case to the list and in this case also the pregnancy ran a normal course and a viable child was born somewhat prematurely but the mother died suddenly the eleventh day after a brief period of vomiting and collapse. The adrenals were the seat of tuberculous processes and there was a process in one lung. In 43 per cent. of all cases of Addison's disease, according to the records, the adrenal process is accompanied by tuberculous processes elsewhere; isolated tuberculous processes in the adrenals are known in only 17 per cent. In Vogt's case there was hypoplasia of various organs and the thymicolymphatic status. The aorta was particularly narrow, the heart small, the thyroid enlarged, the thymus persisting. Vogt adds that even when there is no sign of Addison's disease simple overexertion may completely exhaust the epinephrin secretion and lead to sudden death. Comenati and Karl have reported cases of this kind in boys who died in tetanus and the adrenals were found entirely empty of epinephrin, the excessive muscular action in the tetanus having evidently exhausted the supply. At the necropsy of a young man who had died suddenly after a strenuous bicycle race, the total

absence of epinephrin from the adrenals was the only pathologic finding Schmorl could discover. He and others ascribed this fatality to the acute exhaustion of the chromaffine system by the excessive demands on the heart and muscles during the race. If the delivery in Vogt's case had been difficult, the woman would probably have died then, but as it was exceptionally easy, the end did not come until the second week. The prospects for the child are not bad; in this case the child has developed normally.

120. **Danger of Combining Morphin with General Anesthesia.**—Straub recalls a case in which a surgeon started to amputate the finger of a child under morphin alone but found it necessary to give chloroform, and the child died from arrest of the respiration. Experimental research has confirmed the assumption suggested by this case that the injurious action of morphin on the respiration center may be intensified to a dangerous extent by an anesthetic, like chloroform, which acts likewise on the respiration center. Ether has the opposite effect on the respiration center, stimulating it to increased functioning. He gives tracings of the respiration in animals s it was retarded under morphin and still more under ethyl carbamate. Other tracings show that the retarded respiration under morphin can be brought back approximately to normal by atropin. The research reported suggests that when morphin is given chloroform had better be avoided and ether used for the general anesthetic, and, further, that it is best to refrain from any combination with morphin for children as they are more susceptible to morphin than adults. The research further indicates that artificial respiration is illogical and useless when the respiration center is paralyzed.

121. **Death after Auro-Potassium Cyanid.**—This drug has been stated to be free from toxic action but Hauck reports the death of a man of 37 after a systematic course of treatment with it strictly according to directions. The treatment was for extensive lupus which had resisted all other measures, including tuberculin. The cyanid seemed to have a directly destructive action on the blood and severe hemolytic jaundice developed, fatal in less than two months after the treatment had been started.

123. **Seasickness.**—Friedländer thinks that there is a mechanical factor involved in seasickness, namely, the swaying and dragging of the stomach on the esophagus with the pitching of the ship. As an adjuvant to other measures, he warns not to load the stomach, and advises winding a bandage around the stomach to lift it up and thus remove the strain on the esophagus and reduce the swaying of the stomach. His experience with this simple mechanical measure has been very favorable. He urges its use in connection with Fischer's atropin treatment, remarking that Fischer's theoretical explanation of the nervous causes of seasickness seems logical and convincing. (It was summarized in these columns Sept. 6, 1913, p. 814.)

Wiener klinische Wochenschrift, Vienna

August 14, XXVI, No. 33, pp. 1325-1352

124 Serodiagnosis in Psychiatry. (Bedeutung des Abderhaldenschen Dialysierverfahrens für die Psychiatrie und das korrelative Verhältnis der Geschlechtsdrüsen zu anderen Organen mit innerer Sekretion.) M. Urstein.
125 *The Pupil Sign of Vagotony. (Das vagotonische Pupillenphänomen.) R. Somogyi.
126 *Advantages of Rinsing Out the Abdominal Cavity with Ether in Perforation-Peritonitis. F. Derganc.
127 *Acute Syphilitic Polyarthritis in Late Stage of Syphilis. W. Huzar.
128 Patient Should be Informed if He Has Tuberculosis. J. Kollarits.

125. **The Pupil Sign of Vagotony.**—Somogyi writes from Koranyi's clinic to report the findings in 120 patients, including forty-two between 13 and 25, tested for the pupil phenomenon indicating excessive tonicity of the vagus nerve: The pupil dilates during deep inspiration while it contracts during expiration. This pupil sign is accompanied by irregularity of the pulse; it becomes more frequent during inspiration and slows up during expiration. The respiratory arhythmia may occur without the pupil sign but the latter was never observed isolated. Both phenomena are more frequent in younger individuals. A theoretical explanation is offered and the practical importance of this vagotonic pupil sign is emphasized. The phenomenon is the exact reverse of the pupil-dilating action of epinephrin when the tonus of the sympathetic nerve is excessively high. Vagotony is connected with the status thymicolymphaticus and also with many conditions which belong to the group of neuroses. The difficulty of recognizing this status thymicolymphaticus—which predisposes to sudden death on slight causes—renders extremely important any sign which may aid in its discovery. The most striking evidence of the vagotonic origin of this pupil phenomenon is its association with the respiratory arhythmia.

126. **Ether for Rinsing out the Inflamed Peritoneum.**—Derganc has been applying this method which Morestin and others have been advocating in France. Derganc applied it in two severe cases of peritonitis following perforation of a gastric ulcer, or an ulcer in the bowel, from a trauma. The patients were men of 28 and 36, and the operation was done the fifty-fourth or eighty-seventh hour after the perforation. In the gastric ulcer case, after sponging out the fluid found in the abdominal cavity with dry sponges, he poured in 150 gm. of ether. It made a sizzling noise as it found its way into the depths. The ether was then wiped out again at once with dry sponges. All the loops of intestine had taken on a bright red tint. In the second case the intestine was perforated at two points and he washed out the fecal masses, fluids, etc., with an abundance of hot saline, drying the parts with dry sponges afterward. Then he poured in 400 gm. of ether, wiping the parts dry again with dry sponges. Both operations were done under spinal anesthesia, draining through the pouch of Douglas, and the prompt and smooth recovery from the threatening perforation-peritonitis he ascribes to the use of the ether. (Morestin's communication on the subject was summarized in The Journal June 21, 1913, p. 1971.)

127. **Multiple Arthritis in Late Syphilis.**—Huzar reports three cases of acute multiple arthritis which seemed at first to be ordinary acute articular rheumatism. The knee is generally the joint first involved; with or without some predisposing trauma, the knee swells and becomes painful and then other joints become affected, in turn the elbow and wrist, the finger joints and the sternoclavicular articulation. The temperature may keep within normal range or may run up even to 104 F.; it is generally intermittent. The condition may persist thus for weeks and months; the general condition usually improves or grows worse parallel with the fever, but there is no suppuration in the joints involved. If the syphilitic origin of the affection is recognized in time and specific treatment instituted, conditions soon right themselves and complete restitution follows. If not, the acute phase passes into a chronic stage and various destructive processes develop which it may be impossible to influence with any measures at our command. Huzar remarks that the more we learn about the family history of old syphilitics, the more frequent becomes the discovery of latent syphilis in the mothers, and the oftener we hear of a history of past attacks of "articular rheumatism." It is beyond question that some of these "rheumatism" cases were in fact unrecognized syphilitic joint troubles. In some cases potassium iodid was given for the supposed rheumatism and thus unwittingly proper treatment had been applied. The whole course of the syphilitic polyarthritis is milder than that of acute febrile articular rheumatism, and the endocardium and serous membranes are not affected as with the latter. Nocturnal exacerbations are also characteristic. In any event, the arguments here presented impose the necessity for applying the Wassermann test and starting specific treatment in every case of multiple joint trouble which does not yield promptly to ordinary treatment. The old notion that late syphilitic processes are not accompanied by fever is no longer tenable. He advises treatment with mercury and potassium iodid, with salvarsan in case these fail. The more important German works on the subject are listed.

Zeitschrift für Kinderheilkunde, Berlin

VIII, No. 4, pp. 291-362. Last indexed August 30, p. 722

129 Phagocytic Power of Colostrum Cells. (Zur Biologie des Colostrumkörperchen.) E. Thomas.
130 Unsatisfactory Results of the Cutaneous Tuberculin Test in Children. (Zur Frage der cutanen Tuberkulinreaktion bei Kindern.) H. Rozenblat.
131 *Roentgen Diagnosis of Pulmonary Tuberculosis in Children. E. Rach.
132 Salt-Fever Caused by Heat Retention from Lack of Water. (Kann die Theorie dass das Salzfieber durch Wärmestauung verursacht wird, als widerlegt betrachtet werden.) P. Heim.
133 *Roentgenoscopy of the Infant's Stomach. R. Major.
134 *Right-Handedness in Infants. E. Voelckel.
135 Epidemic Poliomyelitis in the Netherlands in 1912. J. C. Schlippers and C. de Lange.

131. **Roentgen Diagnosis of Pulmonary Tuberculosis in Children.**—Rach found two cases showing a three-cornered shadow with its base toward the heart and the apex extending toward the periphery. On autopsy they were found to correspond to caseated foci lying near the hilus. Ghon's primary focus can frequently be demonstrated radiographically when it can be shown by no other method. (Ghon declares that in practically all cases involvement of the lymph-nodes is secondary.) When there are negative physical findings but a positive von Pirquet and a sharply circumscribed shadow lying to the side of the hilus, the diagnosis is positive. The prognosis of this picture is the more favorable, the older the child. After 8 years of age it generally denotes a stationary tuberculosis and offers the most favorable explanation of a positive cutaneous test. Swelling and caseation of the paratracheal glands on the right are frequent, and are shown by a shadow extending outward from the median line running parallel to the trachea for a space and then rejoining the median line. It generally denotes a progressive tuberculosis involving the bronchial lymph-nodes. An interlobar pleuritis was shown in two cases by a sharp linear shadow corresponding to the interlobar fissure.

133. **Roentgenoscopy of the Infant's Stomach.**—As seen by the Roentgen ray the stomach of an infant in a standing position has the shape of an inverted retort; when lying down, that of an irregular sack. The respiratory movements of the diaphragm cause movements similar to peristalsis. The mechanism of emptying the stomach is similar to that in the adult, but there is not such marked peristalsis. Between meals the stomach is generally not contracted, but is distended with air.

134. **Right-Handedness in Infants.**—Voelckel says that the functional difference in the brain hemispheres which causes right-handedness appears first at the age of seven months and increases from that time on. Before that age there is no difference in the use of the two hands.

Zentralblatt für Chirurgie, Leipsic

August 23, XL, No. 34, pp. 1329-1360

136 Technic for Exclusion of the Pylorus. (Pylorusausschaltung.) E. Polya and A. Hoffmann. (Pylorusverengerung und Bildung eines Lig. suspensorium ventriculi durch freie Aponeurosentransplantation.) R. Göbell.

Zentralblatt für Gynäkologie, Leipsic

August 23, XXXVII, No. 34, pp. 1253-1284

137 Fatal Non-Obstetric Laceration of the Vagina. (Zerreissung der Vagina sub coitu mit letalem Ausgang.) R. Köhler.

Zentralblatt für innere Medizin, Leipsic

August 23, XXXIV, No. 34, pp. 857-880

138 Serodiagnosis of Liver Disease. (Ueber die Diagnose der Leberkrankheiten mit Hilfe der Methode von Professor Abderhalden, mit spezieller Berücksichtigung der Selbständigkeit der beiden Leberlappen.) M. J. Breitmann.
139 Serodiagnosis of Pernicious Anemia. (Beziehung der Magen-Darmaffektionen zu der perniziösen Anämie nach dem Dialysierverfahren von Prof. E. Abderhalden.) B. T. Kabanow.

Gazzetta degli Ospedali e delle Cliniche, Milan

August 19, XXXIV, No. 99, pp. 1031-1038

140 The Wassermann Test and Salvarsan in Inherited Syphilis. E. Mensi.

August 21, No. 100, pp. 1039-1046

141 *Torsion of Spermatic Cord. (La necrosi del testicolo per torsione del cordone.) C. Viscontini.

141. **Torsion of Spermatic Cord.**—Viscontini's patient was an 8-months infant and the spermatic cord had twisted thrice around. The child was apparently healthy and thriving when it began suddenly to scream and twist, keeping this up constantly for hours; then it vomited and the mother noticed that the scrotum was swollen and hard. An operation was done on the assumption of an incarcerated hernia but the trouble proved to be torsion of the spermatic cord and the testicle was found in a state of total gangrene. The torsion evidently occurred as the testicle was descending, and this is the fourth case of the kind on record according to accessible literature. The presumptive diagnosis of incarcerated hernia in such cases leads to waste of time in trying to reduce the supposed hernia and, still worse, the maneuvers for correction and reduction injure still further the already suffering cord and testicle.

Policlinico, Rome

August 17, XX, No. 33, pp. 1177-1212

142 *Exclusion of the Pylorus. (La piloropessia intra-parieto-muscolare quale nuova metodo di esclusione pilorica nella gastroptosi con gastroectasia.) C. Mariani.
143 Intellectual Overwork. (Alcune considerazioni sullo strapazzo mentale.) E. Pietro.
144 Indicanuria in Its Relation to the Pancreatic Juice. (L'indacanuria in rapporto alla secrezione esterna del pancreas.) V. Paglione.
145 Treatment of Lack of Appetite. P. Alessandrini.

August 24, No. 34, pp. 1213-1248

146 Pellagra in the Rome Province. G. Alessandrini, A. Giannelli and E. Fileni.

142. **Exclusion of the Pylorus with Gastro-Enterostomy.**—Mariani has applied in a case of gastroptosis and dilatation of the stomach, requiring gastro-enterostomy, a method of exclusion and fixation of the pylorus which, he says, has many points to recommend it. The stretched pylorus was kinked on itself and was sutured to the duodenum and below to the rectus muscle and subcutaneous tissue, thus not only closing it up completely and permanently but supplying a firm support for the sagging stomach. The functional results were ideal at once, but the patient succumbed during the second week to ether pneumonia. The conditions found at the site of the operation confirmed the advantages of this technic when the stomach and pylorus are stretched enough to permit it.

Medizinskoe Obozrienie, Moscow

LXXIX, No. 9, pp. 733-814

147 Differential Diagnosis of Paranephritic Abscess. B. Shtomitch.
148 *Incision for Calculi in Kidney Proper versus Incision in Kidney Pelvis. (K voprosu o nephro- i pyelolithotomy.) D. P. Shenker.
149 *Fat Implant to Fill Cavity in Tibia. (Slutchai peresadki zhira v. kostnuiu polost. V. A. Perimov.
150 Influence of Meteorologic Factors on Course of Pneumonic Plague in Manchuria, 1910-1911. P. Pawlow.
151 Agglutinins. (Obzor sovremennago sostoyania voprosa o phytohaemagglutinin'ax.) I. L. Yakulenko.

148. **Pyelolithotomy versus Nephrolithotomy.** — Shenker reports seventeen cases of operative treatment of kidney calculi and calls attention to the better results when the kidney pelvis is opened instead of the kidney proper. The patients recover in half the time or less with pyelolithotomy instead of nephrotomy, and the operation is much less of a strain on the system.

149. **Fat Implant to Fill Cavity in Bone.**—Perimov's patient was a girl of 16 with osteomyelitis of the tibia of four years' standing. It had been operated on fifteen months before but a fistula had persisted after the curetting. Perimov enlarged the fistula, scraped out the surface of the large cavity found in the bone and after drying it with sponges, buried in the cavity a strip of adipose tissue 7 cm. long by 4 cm. wide, taken for the purpose from the subcutaneous tissue of the abdomen. On account of the pathologic condition of the skin at the site of the bone focus there was some difficulty in suturing the wound, and the lips parted under the dressings so that the fat implant could be seen when the dressings were changed the seventh day. It had not changed in aspect at all. The outer surface was then scraped away and the defect in the skin closed by two skin flaps from each side. There was no bleeding from the fat graft as it was curetted.

Perimov does not venture to decide the question whether the graft is acting as a foreign body, merely plugging up the cavity, or whether it is being vitalized in the depths. Be this as it may, he remarks, the important fact is that the girl was completely cured of her old bone affection by the end of two months.

Brazil-Medico, Rio de Janeiro

July 22, XXVII, No. 28, pp. 283-296

152 *Prophylaxis of Venereal Disease. A. Porto.
153 Prophylaxis of Leprosy. E. Gomes and F. Terra.

August 8, No. 30, pp. 309-320

154 Transmission of Trypanosome by Brazilian Insect. (Da transmissão do trypanosoma Cruzi pela Triatoma sordida Stal.) A. Neiva.
155 *Prophylaxis of Venereal Disease. W. Machado.

152-155. Sanitary Control of Prostitution.—A. Porto here makes an able plea for the introduction into Brazil of the method of registering prostitutes and keeping them under sanitary control as the wisest method at the disposal of the world at present for the prophylaxis of venereal disease. He discusses the subject under the four heads of individual, moral and public prophylaxis and treatment. By individual prophylaxis he means the intensive and extensive dissemination of all the medical knowledge in regard to syphilis, its contagion, transmission and its disastrous effects. He says that all the leagues and preventive organizations that have been founded have accomplished little or nothing to date. The mother organization, founded at Brussels by Dubois-Havenith, recently went out of existence, and attempts in Brazil to found a similar organization came to nothing on account of the general indifference. By public prophylaxis he means well managed sanitary control of prostitutes, and he takes up in turn the ten most widely urged objections against this system and answers them. As society is now constituted, he says, prostitution has little chance of total eradication at present, and the only thing to do is to reduce its evils as much as possible. The discovery of salvarsan is a new and powerful argument for sanitary control, as under the influence of prompt salvarsan treatment the external lesions heal over with surprising rapidity, which materially lessens the danger of infecting others.

The old objection that the patrons would be lulled into a false security by the certificate of health given the prostitute at the medical inspection, when she may have become infected immediately afterward, he answers by two statements, (1) that the primary sore is generally painful so that contact is usually avoided during this stage and under sanitary control the disease would be discovered before this stage had passed into the non-sensitive and more acutely contagious phases; (2) the certificate might specifically state "Without guarantee," just as certain French patented articles bear the stamp "Brevété, S. G. D. G." (patented, without government guarantee). The objection that sanitary control is infringing on the personal liberty of the women he answers by saying that women practicing prostitution are breaking the laws and undermining the bulwarks of the state by sapping at the foundations of the Family, and hence they have no right to complain of any infringing on their personal liberty.

To the objection that those who deal with prostitutes know the perils to which they are exposing themselves, he answers that no one but a physician can appreciate those perils at their true value. Those who have nothing to do with prostitutes and who say "Let each man assume the responsibility for his adventures," even these are not sure that syphilis may not be brought into their families by some servant or relative. In short, he concludes, it is the duty of the state to keep prostitutes and pseudo-clandestine prostitutes and periprostitutes under sanitary control, but the measures should be applied very liberally and wisely, and the abuses of the system that have been noted in other countries must be kept out at every cost. He says it will be easier to introduce a model system where nothing of the kind has ever been known than it has proved in European countries where it was a question of remodeling old systems.

Machado states that until quite recently he was opposed to sanitary control, and in fact the Academia Nacional de Medicina in 1902 voted against the introduction of any such system. But he has been converted to the necessity for it, and cites statistics from various countries showing the urgent need for it and the comparatively good results from it in France where it is systematically applied. Sanitary control was abolished in Denmark in 1906, and he quotes statistics to show that the number of cases of venereal disease in Copenhagen has increased materially since then, according to the records of physicians: from 6,666 in 1905; 7,065 in 1906, to 10,249 in 1908, while the number of cases of syphilis in 1905 was 1,277 and in 1908, 2,484. To allow prostitutes to ply their trade without sanitary control wisely applied, he declares is a crime of high treason against the prophylaxis of disease (*crime de lesa-prophylaxia*).

Hospitalstidende, Copenhagen

August 20, LVI, No. 34, pp. 981-1004

156 Serodiagnosis of Syphilis. (Fortsatte Undersøgelser over Herman-Perutz' Reaktion Specificitetsundersøgelser.) V. F. Møller. Commenced in No. 33.

Hygiea, Stockholm

June, LXXV, No. 6, pp. 513-624

157 *Epidemic of Diarrhea. (En diarré-epidemi vid K. Västerbottens regemente 1910.) O. Andersson.
158 *Differentiation of Phlegmonous Angina and Diphtheria. (110 fall af peritonsillit och några reflexioner med anledning däraf.) G. Charlier.

July, No. 7, pp. 625-720

159 Early History of Obstetrics in Sweden. (Om obstetrikens ställning i Sverige vid slutet af 1600-talet samt Johan von Hoorns betydelse for dess utveckling.) F. Westermark.
160 Plastic Operation on the Nose. (Fall af näsplastik.) A. Troell.

157. Epidemic of Diarrhea.—Andersson devotes eighty-four pages to the report of an epidemic affecting 472 of 1,235 soldiers during some maneuvers in 1910. The symptoms ranged from those of ordinary enteritis to a syndrome resembling typhoid; in some cases gastric symptoms predominated. The first case dated from Sept. 4 and the others strung along to Sept. 26. The symptoms differed from those of paratyphoid as also from proteus and colon bacillus infection and botulism. He gives a detailed study of the whole epidemic with eighteen tables under various headings. His final conclusion is that the epidemic was due to meat poisoning, although the long period during which the cases developed and the fact that a few of the sick had not eaten any meat are hard to reconcile with this conception.

158. Differentiation of Phlegmonous Angina and Diphtheria.—Charlier reviews his experience with 110 cases of the former and emphasizes the danger of mistaking true diphtheria for ordinary tonsillitis or quinsy and incising. In five cases in which this was done the patients died and in a sixth case, although the patient recovered, yet he was long in grave danger. A history of preceding attacks of peritonsillitis is a great aid in differentiation; also the age, as diphtheria affects mostly children while 83 per cent. of the peritonsillitis patients were between 16 and 39; 9 per cent. over 40, and the other 9 per cent. were between 9 and 15. Another aid in differentiation is absence of known contact with diphtheria. Tenderness of the swollen part of the throat occurs early with peritonsillitis, but Charlier has never known of this with diphtheria. There was no hoarseness in ninety-four of the 110 cases, and there was not the peculiar odor of the breath common in diphtheria. On account of the great tendency to recurrence of peritonsillitis it seems wise to operate on the tonsils in such cases. Sörensen says in regard to the danger of incision in a case of diphtheria which has been mistaken for phlegmonous angina that it is not the incision which renders the prognosis so grave in such cases but the fact that when diphtheria commences with a phlegmonous lesion it is of an exceptionally severe type. In any event, Charlier advises to be wary of using the knife for a supposed phlegmonous angina until certain of its non-diphtheric character.

The Journal of the
American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXI, No. 13—PART 2 CHICAGO, ILLINOIS SEPTEMBER 27, 1913

SECTION ON OPHTHALMOLOGY

PAPERS† AND DISCUSSIONS

THREE OPHTHALMIC QUESTIONS

OPTOMETRY, CONSERVATION, EDUCATION *

HIRAM WOODS, M.D.
BALTIMORE

Fellow Members of the Section on Ophthalmology:

My first and very delightful duty is to welcome you to this annual gathering—an event to which we have learned to look forward not only with pleasure but also with expectations of profit. Renewal of old friendships, contact with men whom we knew first for what they were doing and then claimed as personal friends, opportunities to blurt out our ignorance to hearers who are sympathetic because they have their own to swap for ours, shaking off for the time being the responsibilities and tire of office work and yet staying in the environment in which we are most at home—these are some of the things our annual meeting affords; and they are not lightly to be turned aside.

Some years ago I heard Dr. Osler say something like this—I am not sure even that he ever put it into print, but it ought to go there and ought to be remembered: "The doctor who lives to himself is a most dogmatic and dangerous animal. The patient watches his every expression; the nurse takes what he says as law and gospel; the family waits at the foot of the steps to get the latest news, and rejoices or trembles at the great man's verdict. After a while he gets to believe it all himself. Only when he touches elbows with his fellow doctors does he reach his true level, and because of this he owes it to himself and his patients not to forsake the 'assembling of yourselves together.' "

For my own part, I could afford to do without a great many things better than I could spare the help I get from an annual pilgrimage to this Section, and I know that I have plenty of companions feeling the same way. Of the social side of this meeting I can say only that I do not know anything about it. The Minnesota men served notice some months ago that they wanted hands off; but that provision is ample, and that the man who does not have a good time will have only himself to thank, are facts apparent already to those who know our hosts, and will be apparent to those who do not in a surprisingly short time.

I beg to thank you for considering me worthy of becoming your chairman, and for electing me to that position. I shall crave your indulgence for such errors as I may make, and for such success as attends our meeting I shall ask you to give the greater part of the credit to my friend who occupies the secretary's chair. Dr. Derby has been diligent in and out of season. In all the plans and work he has been ready with thoughtful suggestions and has always been willing to assume his own and others' duties.

He, Dr. Posey, chairman of the Executive Committee, and I decided to make an effort to secure some new working material for our meetings.

One cannot but be struck at society meetings with the number of men who are evidently doing good work, thinking about the problems presented in every-day practice, and yet taking no active part in contributing to the information fund. As the late Dr. Kipp of Newark once said to me, you get at what a man really thinks better on the hotel porch or at dinner than you do in a meeting. We have tried to get some of these men on our program this year, using those who have been the Section's mainstay in the opening of discussions. I think that we have achieved considerable success, and that the program shows not only new names, but also work well worthy careful attention.

In addition to those by members of the Section, we have three papers from invited guests. The trachoma question presents economic problems which have received careful study by the United States Public Health Service. We are indebted to the kindness and interest of Surgeon-General Rupert Blue for the detail of two of his officers, Drs. McMullen and Schereschewsky, to present this subject. With the addition of Dr. Stucky we have probably the three men who know most about the geographic, social and economic sides of this dreaded disease. The Massachusetts Commission for the Blind has sent Mr. Henry Copley Green, its field agent for the conservation of sight, to present to us the big problem of saving eyes; no one has had greater experience, no one can speak more authoritatively. Mr. Herbert E. Ives of Philadelphia has kindly come to discuss the subject of light. Finally, it has been our endeavor to emphasize the pathologic side of ophthalmology. A number of men working in pathology have brought instructive specimens, and will have time to demonstrate them. We have aimed to make the program short, but there is enough to require close attention to the end of the session.

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* Chairman's address.

† As the footnotes indicate, certain papers are here printed in abbreviated form.

OPTOMETRY

I ask your attention to a review of three matters of importance to the science of ophthalmology. The first is optometry. For years ophthalmologists have been forced to go before legislative committees and combat specious arguments in favor of elevating to a profession a large body of tradesmen. Our motive for opposing legislation desired everywhere, and now existing in thirty states, is conviction that it is the duty of a conscientious physician to oppose anything calculated to give the public false teaching on physical and medical truths. My purpose is not to repeat the arguments against such legislation, but to gather some lessons from this experience.

Optometrists have collected a not inconsiderable literature. All of us have read their articles. Refraction roblems are discussed; quotations abound from standard medical works, and, on the surface at least, there is an appearance of scientific reasoning. All the way through, one can see a gradual approach to the "vital" element in refraction. I say "vital" not in the sense of essential—though it is really that—but vital in the sense of a living organism, with its circulation, nerve-supply, functions as an end brain organ; its power, on the one hand, to produce remote symptoms, and on the other to manifest evidence of distant lesion. Usually, as the optometrist writer approaches this point, reasoning wobbles. Soon we are in the familiar torrent of abuse of "drops," laudation of "fogging," attempts to draw conclusions from ocular phenomena clearly symptomatic, and so on. Evidence is conclusive that the writer is working with a mental bias.

For whom are these men writing? Are there in the optometric fold young, ambitious and conscientious men who are deceived into thinking that they are getting the real thing when they read optometric journals? Has the establishments of the optometry course at Columbia University attracted into optometry men with perfectly honest intentions, who believe they are entering a real science because a leading university is willing to take the apparent position of endorsing it? The question is not without importance.

There is, too, an entirely different class of literature, an example being a pamphlet called "Conservation of Vision and Modern Optometry" edited by the Publicity Committee of the American Optical Company. This pamphlet was widely circulated among physicians in Maryland before and during the session of the legislature of 1912. It contains, of course, the usual hysterical claims of glaucoma from "drops," without intimation of the existence of mydriatics which can be safeguarded. A striking feature of the pamphlet is a garbled quotation from the book of the late Dr. Roosa, published in 1889, about producing glaucoma. Omissions from the paragraph, as it appears in the book itself, add greatly to its value from the optometric point of view. Another strinking thing is an attempt to make the late Drs. Norris and Oliver advise against the use of mydriatics. A statement which appears in the book of these writers in the chapter on "Examination of the Eye" is used by the Optical Company under the caption "Danger of Instilling Drops." In the book there is not a word about "danger." The student is warned against relying on a dilated pupil for routine ophthalmoscopic examination. He is at the same time told to dilate the pupil unhesitatingly under certain conditions. All this is omitted in the Optical Company's pamphlet. One unfamiliar with the original source could form no other conclusion than that Drs. Norris and Oliver were opposed to the use of mydriatics.

Finally, just a mention of two items appearing in this May issue of the *Optical Journal and Review*. They are indicative of the mental state and intentions of optometrists. The leading article is entitled "Oculist Opposes Drops in Refraction." It is written by one Herbert Dickson, M.D., of Chicago. Dr. Dickson is evidently a newcomer into the Illinois metropolis, for his name does not appear in the American Medical Directory for 1910, but does in that of two years later. The article itself is a vapid effusion with a few well-known physiologic facts and practically nothing more, except a denial of permanent weakening of accommodation from "drops." This the editor criticizes in a foot-note, and naturally, for it is the optometric Gibraltar. An editorial calls attention to the "argument" against the use of "drops" by the "Chicago oculist," who, incidentally "expects to read a paper in July at the state optical convention in Chicago, explaining his method of treating cataract without operation, and showing how his treatment can be used in cases of glaucoma and optic atrophy." The doctor adds, "I am giving out this new matter at a meeting of optometrists rather than at a medical meeting because my practice has come to me through the help of optometrists and in spite of physicians, to whom therefore I feel no gratitude."

The other item has reference to the recent amendment of the New York optometry law prohibiting the title "Doctor" unless it has been conferred by a duly authorized college prior to the passing of the amendment. An editorial in the *Optical Journal* has this: "It is believed that a number of the optical colleges will be recognized so that graduates who receive degrees from them will be entitled to use the title." It is stated that the New York State Educational Department "gave assurances" to this effect. If I am right in my inferences, the optometrists' "scientific" articles have just enough scientific veneer to fool an uninformed person, student or legislator. Their writers abuse ophthalmologists, but emphasize and welcome every sort of seeming medical endorsement—even to the extent of manufacturing it by garbled quotations. They speak with editorial favor of scheming to circumvent an amendment to a state law forbidding them to use a title which has but one popular meaning, and which they have not earned.

These are the people we are called on to oppose in their endeavor to secure professional recognition. In this work we have done more than prevent legislation in a great many states. The necessary publicity of the matter has had an educational value. It is more generally appreciated now than formerly that glasses are therapeutic means for combating the results of congenital deformity, senile changes or functional results of disease, and that the diagnosis is part of medicine. This knowledge has spread to members of legislative bodies and it is rarely necessary to argue it.

If I correctly interpret the present situation, it is of social rather than strictly scientific nature. True, the latter is its underlying feature, but it is the former which affords the optometrist his greatest strength. I do not know that I can put it better than it was put to me by a member of the Maryland legislature, who has twice helped defeat optometric legislation. Substantially what he said was this:

The optometrist has only a small part of a big science; he is not trained to know even where his sphere of activity ends; his work is full of danger to the public, for without medical training he cannot be depended on to know the difference between health and disease; yet the fact remains that he often does give satisfactory spectacles, and there is a large class of persons whom he has served for years and will probably continue to serve until he makes some blunder. He asserts that he is trying to elevate his own standards.

Then I was asked, "Cannot the medical profession propose something positive?"

I bring this question to the Section on Ophthalmology, with another: Was it wise a year ago to abolish our committee on optometry? True, the *Bulletin* of September, 1911, brought the matter up to date and contains the basic information on which we must work; but legislatures continue to meet, and the situation is constantly changing. The plans of the Council on Health and Public Instruction of the American Medical Association, for broad study of all hygienic matters, put this and all health questions in a new light. I would not be understood as yielding to the present demands of the blatant commercial optometrists, totally unqualified for professional standing, even when judged out of their own mouths. Yet I feel that the Section on Ophthalmology has not done its last duty in this optometry business, and that we still have educational and probably legislative obligations to fulfil. I believe that the first step is the selection of a capable committee of five or more of our own members to take up the matter with the Council for public protection.

CONSERVATION OF VISION

With approval of the Executive Committee, an entire session is devoted to conservation of vision, the subject to be presented by Henry Copley Greene of Boston. Choice between the terms "conservation of vision" and "prevention of blindness" is not without significance. The former includes the latter, but it goes farther, and brings within our purview influences which affect eyes functionally, and which receive but scanty treatment in our own literature. It suggests means for bridging over the critical period of school life—means developed by the thought and skill of the illuminating engineer, the architect and other professional men. It brings us in contact with the social worker, the philanthropist and altruistic organizations.

About three years ago the Russell Sage Foundation held a series of meetings in New York, to which were invited representative men and women from different spheres of work. Much valuable information was gained. Prior to the national work of the Russell Sage Foundation, a committee of the American Medical Association had been collecting data on blindness, studying not alone immediate causes, but also underlying conditions. If one will glance over reports in our Proceedings he will find much of value on every medical phase of preventable blindness. There are, also, in engineering literature and in papers written by our own members, discussions of proper methods of lighting rooms, arranging school desks, home regimen, etc. Much suggestive writing also exists: What should be done for children with defective vision but still sight enough to enable them to obtain some education? What are the functions of the district nurse and the social visitor? How shall innocent children be protected from ignorant parents? These are but examples of activities opened by the concept of conservation. The ultimate goal is to unite into one all these forces, medical, social, educational, philanthropic, moving toward physical, mental and, indeed, moral conservation.

It was with this dream, if I am not mistaken, that men and women attended the Russell Sage conferences, and it was with this ambition that they entered into the formation of a National Association. And yet, with all this information at hand, with a great foundation ready to stand behind a strong movement for conservation, with thoughtful, studious men and women anxious to throw themselves into the work, we have, so far as practical organization is concerned, hardly commenced. Some things have been done in a few states; in some they have been done better than in others, and in most not at all.

In my judgment, national movements have accomplished so much less than was hoped for because work was started before proper foundations were laid. Of what use is literature unless there are arrangements to receive and distribute it? Of what use, beyond exciting a spasmodic and temporary interest, are exhibits, unless professional and public minds have been prepared for them, and unless there exist forces to push home their lessons? What is needed is the organization, in the medical ranks of every state, of a society to keep at work till the general profession has learned its duties, the philanthropist his, the legislator his. We need leadership. It should be furnished by this Section, acting with the Council on Health and Public Instruction of the American Medical Association. Dr. Posey has carefully studied this sphere of conservation. He, and Drs. Wood and Lewis, have been asked to present a report, which they will do at our executive session.

EDUCATION

In the educational number of the *Bulletin* of the American Medical Association, issued Sept. 15, 1909, there is published under Section 8 the report of the subcommittee on diseases of the eye, ear, nose and throat. The ophthalmologists on this committee were Drs. deSchweinitz, Jackson, Standish and Wilder. Among the recommendations made was that ophthalmology, in the sense of pathologic conditions, should not be taught during the first or second year; "whether the third or fourth year of the course should be selected for the presentation of these subjects necessarily is best decided according to the arrangements of individual schools." Before beginning ophthalmology, however, the student should have certain preliminary training "in the anatomy, structural as well as regional, of the eye." He should also receive careful training in its physiology "and an arrangement should be made with the department of physiology in each medical school . . . by which the students in the year preceding that in which they receive their training in these several branches should have the opportunity of obtaining the necessary physiologic instruction." There should also be clinical demonstrations to smaller sections of the class, the student being required to make his own examinations and diagnoses. There are recommendations regarding the number of hours of instruction, didactic and clinical, subjects to be included in the course, qualifications of the instructors, etc. The last section of the report contains this: "Thus far the report has made no reference to the instruction in pathology and pathologic anatomy. . . . In the number of hours allotted, a sufficient time must be given to this particular subject to enable the student to obtain a satisfactory understanding of his clinical work, and each teacher will naturally include instruction in pathology in his course."

The recommendation that training in anatomy and physiology should immediately precede the study of abnormal conditions is important because the medical student of to-day has so many things to think about that he is in a more or less chronic state of mental acrobatism. If the superstructure is not put on before the foundation has had time to crumble, he can have only insecure knowledge; the farther his pathologic is removed from his anatomic and physiologic training, the less apt is he to understand the former or remember either. The same is true of the relation of a specialty to general pathologic principles: and here is a question for every conscientious teacher to ask himself—how well qualified is he to teach his own specialty on the basis of general pathology? Probably he received no such systematic training when he was a student twenty years or so ago; diseases were taught by symptoms, and treatment was based largely on the physiologic action of drugs. Do teachers sufficiently appreciate the change they must make in conception, and realize how readily the eye lends itself to illustration of general pathologic principles? It is no uncommon thing to find that our best students forget, after two or three years, the diagnostic signs of common eye diseases. The reason is not hard to find. They had not been given a proper thinking basis because the specialty had not been harnessed to pathology.

To determine the extent to which our medical schools have complied with these recommendations, I sent a questionnaire to the deans or the professors of ophthalmology of schools ranked in Class A plus, and A, as given in The Journal, Jan. 18, 1913. These questions included:

1. The year for preliminary instruction and position of the instructor.
2. Whether or not didactic instruction is given.
3. The time and extent of section teaching.
4. Elective courses.
5. Facilities for postgraduate work.

There are sixty medical schools classified as above, and up to the time I was compelled to prepare this paper, replies had been received from thirty-six. Probably a larger number would not materially affect conclusions.

All of the replies state that some instruction is given in anatomy and physiology, and in all but two of the schools prior to the teaching of ophthalmology. It is impossible to judge of the extent of this teaching. Evidently it ranges from mere presentation of gross anatomy to sectional laboratory instruction in both anatomy and physiology. Instructors are the professors of anatomy and physiology or their assistants in twenty-eight schools. In most schools this instruction is subsequently reviewed by the professor of ophthalmology. In four schools only the professor of anatomy is concerned, no mention being made of physiology. In two preliminary teaching is left to the physiologic department, and in two more it is given by the professor of ophthalmology in the first or second year. The time given to this preliminary instruction is:

First year only	4 schools
First and second years	16 schools
First, second and third years	1 school
Second only	10 schools
Second and third	2 schools
Third only	3 schools
	—
Total	36 schools

The time relation between preliminary instruction and ophthalmology is:

According to recommendations of committee (i. e., in two successive years)	17 schools
One year between preliminary instruction and ophthalmology	11 schools
Two years between preliminary instruction and ophthalmology	6 schools
Two departments begin together in third year	1 school
Two departments begin together in second year	1 school
	—
Total	36 schools

It thus appears that but one less than half of the schools heard from have adopted the plan of successive years; evidently there is a general tendency to follow the committee's advice. All of the eleven schools with a single year intervening end preliminary instruction in the second, and give ophthalmology in the fourth year. This is doubtless due to the crowded nature of the third year. Three schools attain the "successive" idea by giving special anatomy and physiology in the last part of the third year—a good idea if the chief course is put in the fourth, and if the third year affords time.

My second question had reference to didactic teaching. Evidently there is no stampede to do away with the old method. There seems to be some tendency to depart from lectures and to substitute reading, quizzes on this reading really taking the form of "conferences," "round-the-table talks," etc. The fourth year is still selected by the large majority of schools for didactic instruction. In my judgment this work should be put into the third year, when feasible, because it will receive more thought if introduced before the exigencies of graduation present themselves. Six schools neglect the didactic course entirely, or give it in a modified form. The character and standing of these schools make this tendency important. The University of Colorado, for instance, makes laboratory instruction a prominent feature of its didactic work. The University of California limits its didactic instruction to "a few lectures in the third or fourth year." Leland Stanford Junior University confines it to "association with clinical cases in the senior year." The reply from Cornell University states that didactic lectures illustrated by lantern-slides are given to the fourth-year students; the number of lectures is not stated. Evidently it is small. In Columbia, didactic teaching, if it can be so called, is limited to one clinical lecture a week for one-half year. The Johns Hopkins University gives no didactic teaching, apart from explanations in its clinical work, until the fourth year; then didactic lectures are elective. Required instruction in this university consists of ophthalmoscopy for two or three weeks in the second year and clinical demonstration daily for six weeks in the fourth year. The Iowa State University, the last of those showing a tendency to give up didactic teaching, seems to occupy a position of its own. A personal letter from Professor Dean illustrates how he has hypnotized the authorities of the university and obtained about all that one should desire—maybe a little more. He says:

> In the fourth year . . . about 50 per cent. of their time is devoted to ophthalmology. Throughout the fourth year the class as a whole receives two and one-half hours per week of instruction. This consists of clinical lectures illustrated by cases. Following the lectures the students see the cases, each case being then in charge of a separate demonstrator. The class is divided into three sections. Each section receives the following work for one-third of the year: three hours per

> week of outclinic service; three hours per week of operative service; two hours per week of ward class work. During this time each student has at least six bed-patients under his personal observation.

In addition to this undergraduate work, Dr. Dean has at his disposal three salaried positions to which he can appoint graduates.

The wisdom of departing from didactic teaching is certainly questionable. It has to be decided according to the opportunities and environment at each school. Also the class of students is a factor. A good teacher, with students well grounded in anatomy, physiology and the principles of pathology, can no doubt save time and give more valuable instruction with the patient before him. On the other hand, there is a certain numerous class of students who will better understand what they see if they know previously what they are to look for, and on what symptoms and signs depend. Retaining or abandoning didactic teaching must be a local issue; but it is evident that there is a tendency to discredit it.

Section teaching is reported from every school. The preference is for the fourth year—twenty-five schools. In one school it is confined in the third year; in eight others it is divided between the third and fourth; and in two the year is not given—probably the fourth. A rather striking reply is from Cornell University; section teaching is limited to eighteen hours in the last term of the fourth year, a period, it seems to me, entirely too late to begin such work. Some of the larger universities have a certain number of beds set apart for eye patients; these are used in section instruction. It would seem that at least a beginning has been made toward providing such instruction as will lay a proper foundation for postgraduate work. The time devoted to section teaching varies from ten to forty-six hours per section. Comparing some of the reports with the catalogues, it is obvious that a practical difficulty in section teaching is obtaining a sufficient number of capable instructors. In some of the schools large classes have to receive this instruction from the professor of ophthalmology with one or two assistants. It is impossible with such inadequate force to meet the requirements of twenty hours' section teaching for each student.

As to elective courses, replies from twelve schools state definitely that there are none. Ten others recite clinical opportunities at general and special hospitals of which the student may avail himself if he so desires, but this is a matter of volition. In fourteen schools there exists some sort of an elective system. In seven of these it is limited to ophthalmoscopy and refraction. In one the student is allowed to elect ophthalmology, and if he so desires "spend all his time in this work." In but four of the thirty-six schools from which I received replies does there seem to be attempt to give elective courses in all departments. These are Johns Hopkins University, University of Colorado, Harvard and the University of Pennsylvania. The University of Iowa should probably be added to this list on account of the large scope of its work. The remaining school which reports an elective course is the Rush Medical College. I have placed it alone, because, coming as it does from so thoughtful a teacher as Dr. Wilder, it merits consideration as a standard for elective work. The course includes advanced work in anatomy, pathology and bacteriology of the eye, with courses in refraction. It seems to me that this limitation is wise. If the standards of ophthalmologic teaching and practice are ever to be elevated, the four subjects to which Dr. Wilder limits his elective courses must be the foundation. Unless men are tied up to these subjects, with, of course, needed clinical illustrations, they will not, save in rare instances, give them the necessary attention.

An interesting fact brought out by the replies is the small importance which teachers are attaching to operative courses for undergraduates. In but two schools are they compulsory, the Jefferson Medical College and the Medico-Chirurgical College. In the latter each student does six different operations on pigs' eyes. In two schools, Johns Hopkins University and the University of Michigan, operative work is elective. Reference is made in some of the replies to facilities for operating on animals' eyes if students so desire; but they are not encouraged to do so.

The Section has very recently heard about such postgraduate work as exists. The Universities of Pennsylvania and Minnesota are apparently earnestly engaged in organizing it on a scientific basis. Dr. Jackson's work in Denver is well known. The University of Iowa seems to have made real headway; Tulane University reports adequate opportunities for postgraduate hospital work, and Harvard has an organized course. Dr. Wilder, at Rush, offers what is essentially a continuation of the elective course to undergraduates. He says "facilities for postgraduate work embrace courses in pathology, anatomy, refraction work in the dispensary and at the hospital clinics." Three of my correspondents were good enough to outline their ideas of postgraduate work. For instance, Dr. Todd thinks that two years at least should be given to it; the first, as an intern in a hospital with time devoted to laboratory study, the second as an instructor and assistant in operative work; this, he thinks, should be followed by a year abroad. Dr. Jackson is in accord with Dr. Wilder regarding the necessity of strictly scientific branches; so, evidently, are many others.

It is impossible to divorce undergraduate work from postgraduate work. We recognize that a student cannot be made a competent ophthalmologist at graduation by any system available. But behind this truth there has lurked a tendency to reduce special teaching to what has been termed "essentials"; in other words, to attempt nothing more than teaching diagnosis of common diseases and how to avoid dangerous blunders. It will be hard to do more: *method of teaching this* is the important question.

As to past methods, we note that: first, many schools force the student to view ophthalmology as an addendum to, rather than an integral part of medicine—something to be taken seriously only if he expects to enter this specialty; secondly, the attitude of the schools has been reflected in state boards. Of fifty-three states and insular possessions, the laws of but seventeen require examinations in ophthalmology. In a few others a question or two sometimes appears on a surgical or obstetric paper, but that is about all. Without impressing the fact that every division of ophthalmology can be properly studied only from the point of view which controls all medicine; with the majority of state boards cutting eye diseases out of their requirements, is it any wonder that the six weeks' course has appealed to students as the logical thing? A few men —some of them recognized leaders in thought and practice—have tried to meet the situation by establishing postgraduate courses which begin with preliminary instruction in anatomy and physiology. We know the result. Students who thought beyond the standard of their undergraduate schools have created in such postgraduate courses, in hospitals or private offices, opportunities for what Edward Jackson has termed "self-teaching." The rest, or a majority, obtained a veneer and became incompetent specialists, and state laws did nothing to prevent them. Introduction into undergraduate work of really careful preliminary teaching in anatomy and physiology, self-training in pathology by the eye teacher, if necessary, and ophthalmic instruction from these points of view may be depended on to change the student's mental attitude and fit him for postgraduate university opportunities. Through the proper channel in the American Medical Association, state boards should be urged to enforce the lesson.

Even then we must not lose sight of another thing. Ophthalmology is a very broad specialty. There is the relation between remote or systemic disease and ocular function or lesion; nature and reason of ocular manifestation; ametropia; relation of disorders of motility to remote troubles; differential diagnosis as to which is cause and which effect; the neurologic side of ophthalmology; its surgery; its all-important laboratory side; in a word, as Dr. Reber has pointed out in a recent paper, an oculist's office is almost a clinical laboratory in which special and technical investigations are made touching all parts of medical science. As we are advancing in our own thinking, so are our confrères in theirs. I question if we shall ever secure the symmetrically developed ophthalmologist, held up as the ideal by Jackson: a man trained and proficient, equally and adequately, in all these departments. The human equation and environment will always cause a certain amount of one-sidedness. Laboratory technic is very desirable, but it is not so important for the eye man as ability to deduct proper conclusions from laboratory findings, or to know when he needs laboratory help. He may be able to acquire this best from a laboratory confrère.

The first step in proper teaching of ophthalmology has been taken—insistence on preparation in undergraduate life for medical ophthalmic thinking. The second is to devise what Dr. Osler spoke of recently in Baltimore as "method—which is all we can teach students." We must remember that it takes time, and a good deal of it, to become fairly proficient in our own technical work; that we are preparing men for their life-work and they want, and ought, to get at it before their formative period has ended; that, after all, self-tendency will inevitably lead to self-teaching, and over-training has its dangers. Nothing is farther from my mind than a reactionary policy; but the essence of postgraduate work is neither multiplicity of subjects nor amount of time. It is drill in thinking: training in method. Simplification and formulation of that method is our present problem; and it is a most complex one.

With general professional awakening to the necessity of improved methods in ophthalmic education, and the response of schools to suggestions concerning undergraduate work, there should be no doubt of university response when asked to furnish adequate postgraduate facilities; but furnishing these facilities is only a beginning. Other avenues to ophthalmic practice will continue to exist. Even now there are here and there well-organized postgraduate courses, so far as they go. Capable and conscientious men, with no pretense to offering organized courses, take private students into their offices and hospital services, and see that training is founded on proper principles. Such teaching will continue. Unfortunately, so will the six weeks' courses and other attractive short cuts. In deciding where to take his postgraduate training many an honest fellow, with genuine desire to get the best and do his best, will be forced to consider the element of time. Periods of two or three years, after graduation, have been suggested as the earliest time at which a student be admitted to university postgraduate work. Add one or two years for this work, and a man may find himself confronted with the dilemma of giving up what he knows he ought to take, or entering on responsibilities which he knows equally well he cannot assume. Postgraduate work will develop itself, and experience will be needed to work out all mooted points. One item in method on which I think insistence should be made is that we avoid such detailed instruction as will, by its very length, hinder general acceptance. This is but one of the economic problems involved. Another is some regulation of state license for special practice. It is a matter of professional gratulation that at its meeting in Washington last month the American Ophthalmological Society appointed a committee to study this postgraduate problem with special reference to a degree of Doctor of Ophthalmology. Those on the committee are Drs. deSchweinitz, Risley, Weeks, Standish and Jackson. That a proper solution will be reached by such men may be accepted. In my judgment, this Section should have its own Committee on Ophthalmic Education, and I recommend its appointment, to report at our next annual meeting.

You may be interested in a criticism of our Section from Dr. Welch. He said to me, "The Section on Ophthalmology has been distinguished by two traits: it has kept out of politics and minded its own business." This business, he continued, has been to enlist the services of the best men in the specialty, to seek instructive papers, and to elevate standards. Can we formulate the purposes of our existence better than has this distinguished pathologist?

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PHYSIOLOGIC OPTICS THE BASIS FOR TEACHING CLINICAL OPHTHALMOLOGY

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There are two features of our present methods of teaching ophthalmology to which I invite your attention. The first is that while the most important part of our subject is physiologic optics, we have made no adequate provision for teaching it. I have said elsewhere that physiologic optics is the most important department of ophthalmology because it is, on the one hand, to this that most of our time is devoted in our daily office practice, and because it is the one distinguishing feature which characterizes ophthalmology and which we do not share with other sections as we share anatomy, general physiology, pathology, materia medica, etc. But this understates the case. The fact is that physiologic optics so permeates the whole fabric of ophthalmology that it is as impossible for one to master any chapter of the subject without a good understanding of physiologic optics, as to weave a yard of cloth without the woof!

Let us consider a few chapters of ophthalmology with this in view. Take lacrimal troubles: Physiologic optics does not enter into the question of how to treat a lacrimal abscess or obstruction of the nasal duct, but that is not the whole chapter. How about the cases of lacrimation in which there is no obstruction to the flow of tears from the conjunctival sac to the nose—in which there is excess of secretion? Here we must consider all the possible sources of irritation which may stimulate overproduction of tears, among others errors of refraction, also the conditions under which the eyes are used. This may involve investigating the character of the illumination, natural or artificial, the possibility of exposure to excessive light or the attempt to work with insufficient or improper quality of light. The mere fact that we are called oculists seems to imply that, in some way, we are endowed with the ability to decide these questions, though I am sure I do not know where instruction is offered to ophthalmologists in the important field of illumination; a field in which engineers are doing excellent work, but in which little is heard of ophthalmologists.

Consider phlyctenular troubles. In the majority of cases, occurring as they do in children, correction of faulty diet and hygiene and the application of yellow mercuric oxid or calomel will quickly cure. But that is not the whole story; there are cases, especially in older patients, in which attention to errors of refraction is needed to prevent frequent recurrence. Then, too, there are the problems arising from old scars of former phlyctenular ulceration — problems which of course involve physiologic optics.

Take the chapter dealing with the relations of the eye to diseases of other organs. When dealing with a patient referred to us under this heading we are liable to have to examine every part and function of the eye. Visual acuity must be taken, which requires the correction of possible errors of refraction and accommodation, and examination of the media, so that we can properly apportion any possible reduction of vision between defects of the optical part of the eye and defects of the retina, conducting paths and visual centers. Then the fundus must be examined, and of course ophthalmoscopy cannot be divorced from physiologic optics. Next there are the ocular muscles, including the pupil and ciliary muscles, which constitute a large chapter of physiologic optics. The visual fields have to be studied in settling many questions which arise in connection with diseases of other organs. Here is a chapter of physiologic optics which cannot be learned by intuition; a field in which we can ill afford to be ignorant of the work of others. The mere purchase of a perimeter does not make one an expert in detecting scotomas and mapping defects of the visual fields—still less in interpreting what he finds. Then there are questions of color-sense, central and peripheral; even the detection of dichromatism or abnormal trichromatism, though sometimes left to subordinate railroad officials, is not a matter that the mere possession of M. D. after one's name enables one to deal with in the absence of special training.

Enough; it is needless to take your time enumerating diseases and showing how, in one way or another, knowledge of physiologic optics is required for any mastery of the subject. How have we provided for teaching this subject any better than for teaching the less important parts of ophthalmology? We have not provided so well.

The subject of the teaching of ophthalmology in general has been treated by several writers recently, so that I need not rehearse that question. As to physiologic optics in particular there is this to be said: Most medical schools give some instruction, often with laboratory work, to first-year students in the course in general physiology. All postgraduate courses in ophthalmology give some instruction in physiologic optics because it is an essential part of every chapter in ophthalmology, but nowhere in this country has there been a regular systematic course in physiologic optics founded on laboratory work and covering all the main subdivisions of the subject in reasonably adequate fashion. This is a curious state of affairs when you come to think of it. It is just as if there were no course in pathology for students of general medicine, no laboratory work, no lectures, except what were given, incidentally, in connection with the instruction in all departments of clinical medicine and surgery of which it is an indispensable part, just as physiologic optics is an indispensable part of every department of clinical ophthalmology.

In discussing a proposed course to supply in some measure this lack, the question arose: Suppose a course of 300 hours, largely laboratory work, were offered in physiologic optics, who would take it? This brings me to my second point. In recruiting the ranks of ophthalmologists what method is followed? Something like this: a number of courses are offered in different branches of ophthalmology; any one who wishes to become an ophthalmologist is at liberty to look over the list, select what he thinks he would like, reject what he thinks he would not like or thinks may not be of use to him, and when he thinks he is ready he joins the ranks of the ophthalmologists. There is no one to criticize or pass judgment on his fitness, no one to assure the general practitioner, still less the general public, of his competence. Suppose that in the case of general medical education the courses of study were entirely elective, with no board to pass on candidates' fitness and grant them license to practice, what would be the consequence? Do not suppose that I am about to advocate a system of licensing oculists. There is a far better way. Provide an adequate course of training leading up to a degree, or diploma, as already proposed and begun by Dr. Edward Jackson and others, and the possession of the diploma will suffice for guarantee of at least minimum attainments in ophthalmology.[1] What I would plead for is a recognition of the basal, the supreme importance of physiologic optics in any adequate course of preparation for the practice of ophthalmology. Let an adequate course in physiologic optics be offered and, though the rank and file will doubtless pass it by if it is not required, the few who are not satisfied with attaining a "pass" grade, but want the best possible training within their reach, will, I believe, be glad to avail themselves of it. Should a preliminary course in physiologic optics be recognized by large eye hospitals as an important qualification in candidates for appointments as house-officers, a considerable step forward will have been taken.

Let us consider what should be included in our course in physiologic optics to make it "reasonably adequate." We would emphasize the value of paying special attention in the preliminary education to physics and of making mathematics cover algebra, geometry, and if possible some trigonometry. More mathematics can be taken to advantage, but cannot be regarded as essential. It is not merely that algebra, geometry and physics are used in physiologic optics; there is another reason for studying them, and that is the development in the student of some ability to look at a problem from the mathematical point of view and to appreciate a mathematical proof.

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[1] Similar criticism can be made of the other specialties though the matter may not be so urgent with them as with us. There is no recognized standard of training and experience—of fitness in short—which a man need show that he possesses before posing as an expert in otolaryngology, in operative surgery, in gynecology, or any other special field.

Coming now to the course itself, what should be the scope and general plan of treatment? It would be wise to avoid making the work too exclusively laboratory, scientific and theoretical; rather the laboratory and the practical or clinical sides should be carried along together. This will be an advantage for the instructor, in preventing him from losing his practical grip, and an advantage to the student, in keeping up his interest and aiding him to grasp the subject and is, in short, the proper pedagogic principle. What we want is not merely to acquaint the student with the principal facts and laws of physiologic optics, but to make them so much a part of his mental equipment that he will apply them to all his clinical work—nay, rather, it will be so much a part of his mental atmosphere that he will see all problems through that medium, so that he will not have to *apply* the principles of physiologic optics to his work; his whole thinking and reasoning will be colored by, be in terms of, physiologic optics! This can be accomplished only by interweaving the laboratory and clinical work so that they never are divorced—never seem like two subjects, approached in two different ways.

Is this not clearly better than to have all the laboratory teaching done by one man, and all the clinical teaching done by others? The problem is not unlike the well-known question: which is better, a treatise on a subject by one author or one which is the work of several? Is not the answer that a single author is likely to produce a better introductory work as having more unity, consistence and proportion; while for advanced work a series of monographs by various writers may be superior as giving various points of view and permitting more exhaustive treatment, while the advanced student will not be misled, as a beginner would be, by contradictory statements made by teachers who hold different opinions on debatable points? The matter will probably be determined in any given case by the local conditions—what men are available and how much time they are willing to devote to teaching. If the introductory work has to be divided among several, then let the division be not into laboratory work by one and clinical work by another, but into subdivisions each treated by instructors from both the laboratory and the clinical points of view. After the introductory course there should be advanced work devoted to clinical or laboratory work, as the case may be.

If there is danger of the clinical work swinging away from the laboratory, there is also danger of the laboratory work getting out of touch with the clinical side—a tendency to devote too much time to problems solely of academic interest or having only a remote bearing on practice. It is not that I wish to disparage the study of pure science, as distinguished from applied science, but this course is not the place for it, and there are problems in abundance of every-day practical value, just as important scientifically and as suitable for training.

Another suggestion as to methods of teaching is that the student be required to solve problems in great abundance. We may well profit by the experience of teachers of engineering. If you will take the trouble to ask experienced and successful men in that work, they will probably tell you[2] that nothing gives a surer grasp of the subject, and a better mental training, than solving problems; it develops independence, self-reliance, accuracy, instead of loose, inaccurate thinking and dependence on rule of thumb. In connection especially with dioptrics and errors of refraction I would not only give students many problems (to be solved largely mentally, by the reduced eye of Donders), but I would require students to invent a great many for their own and each other's solution. The ability to state clearly what problem is presented by a given patient and, if possible, to reduce it to figures is a great help toward clear and accurate thinking, and is the best way to acquire the habit of using these methods in daily work.

Similarly, it is an advantage to have students make some of their own apparatus, or at least set it up themselves, since in this way far better insight is gained. There is a limit of course to the time that can be afforded for that work since, being an introductory course, it must cover a certain minimum number of topics.

Treated in this way it is at once apparent that the subject cannot be adequately covered in a few weeks. It is my opinion that from three hundred to five hundred hours is the minimum for a course designed to cover the essentials without trying to be exhaustive. The time required will depend a good deal on how much clinical work is included in this course and how much of that work is put into other courses. To be definite and concrete, let us apportion the time among the chapters without attempting to enumerate all the headings. For dioptrics and errors of refraction allow 150 to 250 hours. This must include: a review of physical optics; dioptrics of the eye; ophthalmometry; ophthalmoscopy; retinoscopy; hypermetropia, myopia, astigmatism, presbyopia; accommodation; mydriatics; and other allied topics. For ocular muscles and binocular vision allow 100 to 150 hours. This will include: anatomy and physiology of the ocular muscles; strabismus; insufficiencies; tests; stereoscopic vision, true and false; fusion training; projection; nystagmus; torsion, true and false. For the remaining chapters allow 100 to 150 hours. Here will be included: light sense, effects of radiation on the retina and other parts of the eye; adaptation; law of Weber or Fechner; sources of light; photometry; spectroscopy; distribution of light; lighting of houses, offices, schools, and other problems of illumination; color sense, normal and abnormal, central and peripheral; apparatus for detection of defects; visual fields for form, color, light; apparatus, sources of error, limits of accuracy; mind-blindness, optical delusions, and other psychologic problems.

The problems involved in teaching physiologic optics, on any such scale as above outlined, are so new to us that there is abundant room for discussion and differences of opinion. That there is room for difference of opinion as to the *need* of such training I am unwilling to admit.

ABSTRACT OF DISCUSSION

Dr. Frank C. Todd, Minneapolis: Altogether insufficient attention has been given to the systematic training of ophthalmologists. It is therefore quite timely that the Section on Ophthalmology of the American Medical Association should consider the question of the proper preparation of the ophthalmologist. Dr. Lancaster is certainly correct in criticizing our present lack of system in such training, and his suggestion of the need of a more complete course in physiologic optics, which surely is an important basis for the teaching of clinical ophthalmology, is a wise one. If then we admit that he is correct in stating that physiologic optics should form the basis for the teaching of ophthalmology, it remains to determine the question as to the amount of time that should be devoted to this subject. I confess that I do not feel able to determine this point. The beginner in the practice of ophthalmology will have little opportunity to perform the major eye operations, and I believe it is the usual experience of the beginner that he has no such operations for several years in his private work. Nearly all of the work that comes to him consists in the application of his training and study of the errors of refraction, muscle insufficiencies, or at least those diseases and afflictions dependent on such errors, so that in the average instance such a beginner would be better prepared to undertake the work he will be called on to do if he has had an adequate training in physiologic optics, than if he has spent a large amount of time in the preparation for operations which he will not have the opportunity to perform during those weary days of waiting. There comes into this discussion the question of the division of time and the relative importance of the various subjects that should be required to round out and properly train an ophthalmologist. It is a somewhat similar problem to that of determining the relative importance of the various branches of medicine and the amount of time that should be allotted to each department in the undergraduate medical school where men are being trained to become general practitioners. Indeed, it is a subject for careful consideration and thorough discussion, and I believe that most of us are as yet unsettled in our ideas, as we are only entering into its proper consideration. Thanks largely to the campaign that has been started by Dr. Edward Jackson, the profession and especially the teachers are becoming interested in this subject and alive to the necessities for a change. This particular question then is but one of many that should be settled in this very important matter of the proper and adequate preparation of an ophthalmologist. The scope of Dr. Lancaster's paper does not permit of the discussion of this larger subject at this time, and I hope it will not only bring forth a fruitful discussion, but that some action may be taken in the way of the appointment of a committee as suggested by our chairman in his opening address, to consider the whole question of the proper training of an ophthalmologist. Such a committee could prepare a model curriculum and make other recommendations that would be of very great value.

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[2] Noyes, A. A.: Science, New Series, xxviii, 657. "It is power that counts; what a man can do, not what he knows. Problem-solving is by far the most effective means we have of developing mental power."

Dr. Edward Jackson, Denver: Dr. Lancaster's paper alludes briefly to the connection of physiologic optics with lacrimal disease. As he casually mentions it one might think it not an important matter, but it may be extremely important. A few months ago a woman of 30 came to me with this history. She had been treated for lacrimal obstruction for nine months by a man of wide experience, for many years professor of ophthalmology in a good medical school, and six and one-half months by a younger man, who has good work to show for a postgraduate course in Vienna. The lower canaliculus had been slit, solutions injected, probes passed daily, or at longer intervals. The lower lid and adjoining portion of the cheek were red and eczematous from the tears that ran over, although every night she used a protective ointment, without which the skin became much worse. She was wearing glasses R.+1 cyl. L.+1.25 cyl. axes 90°. She needed the cylinders increased 0.25 D, their axes shifted 15° and 8° respectively and +1. D spherical added. Without treatment of the lacrimal apparatus, she was markedly better in ten days. In a month she reported that not a tear had flowed over her cheek for over a week. In three months she was entirely well except that the lower canaliculus has been slit; and, as when I first saw her, entirely closed, probably from treatment. This is not the only case of the kind. Something like one-third of the cases that I see which have been treated for lacrimal obstruction are of this general character. They represent lack of fundamental training with regard to physiologic optics. Dr. Lancaster's remarks may be thought of as commonplace and unimportant, but they refer to facts whose enormous importance is not appreciated because they are so common.

Dr. S. D. Risley, Philadelphia: My experience is entirely in accord with Dr. Jackson's remarks but I wish to say that in many cases I have seen persistent trouble in using the eyes for near work, due to retention of the tears, caused by a contraction of the puncta. When the tears are retained they accumulate along the border of the lower lid, forming a prismatic pellicle on the cornea, which, when the eyes are turned downward as in the act of reading, materially changes the refraction of that membrane. This condition is readily overlooked but when discovered is readily removed by dilating the puncta. Therefore, lacrimal disease may be a disturbing factor in physiologic optics.

Dr. Lucien Howe, Buffalo: Our attention should not be diverted from the main point at issue—the practical education of the ophthalmologist. The time has come when we can no longer cram the brain of each medical student with exactly the same group of facts. Instead of that we must make sure that everyone has a broad and secure foundation. Then in the last year we can allow each to select that group of studies to which he is inclined, or to which he shows special aptitude. If he prefers to know a little of each different branch as at present, he could receive, as he does now, the degree of doctor of medicine. But if, during the last year, he would study physiologic optics, the pathology of the eye, and do similar work in an ophthalmologic laboratory, these studies could be received by state law as an equivalent for obstetric operations, gynecology, radiography, or the minute details of dermatology, laryngology, or other specialties for which the ophthalmologist has no immediate need. A man thus specially equipped in ophthalmology might properly receive the degree, not of doctor of medicine, but doctor of ophthalmology, or ophthalmic surgeon, or be given some such title here just as he can now receive it, with even less special study, at Oxford. A similar evolution has already taken place in the colleges and universities with regard to other degrees. Those institutions no longer require each man to become a bachelor of arts, but with the same time devoted to equally good training in other departments, the student at the end of his four years is made a bachelor of science or an electrical engineer, or given some other appropriate title. If we have the pharmacist and doctor of dental surgery, why should we not also have doctors of ophthalmology? If that degree were granted by reputable institutions and approved by state law, it would better conditions, by graduating men better equipped than now and give us a better class of colleagues. Incidentally, it would be much worse for the opticians who now blind the public eyes in more ways than one, by calling themselves doctors of optics. I think the time has arrived for this next step in the evolution of the study of ophthalmology.

Dr. A. Edward Davis, New York: Dr. Lancaster's paper and the Chairman's address certainly have a direct bearing on each other. We must not underestimate the importance of physiologic optics, for that is the superstructure. The basis and foundation should be the preparation of the student in the histology and pathology of the eye. In this country, at least, that is where the specialist is weak, and he is also weak in physiologic optics. We have to go abroad if we want to study the histology and pathology of the eye, and they constitute the very kernel of the subject, which takes us abroad more than anything else. We excel in this country in physiologic optics, although it is poorly taught. Before a man becomes a specialist, like the artist who paints the figure, he must study anatomy if he wants to make a good picture and put the drapery on correctly. If we train these men in the histology and pathology of the eye they are then ready to put the glasses on in the proper way. They know what they are driving at. Another point is to teach men the intimate relation between the eye and general diseases. An oculist should be something more and not something less than a doctor. In other words, where all have the same course to a great extent, a man should know his mind as to the line he will study later, before leaving the medical college; but failing in that, he must do it afterward. That is the time to get the superstructure. The disgrace of optometrists and optometry in this country is due perhaps in great measure to our own faulty training. No man should even be allowed to fit glasses unless he has all this training.

Dr. Frank Allport, Chicago: I do not know whether I misunderstood Dr. Howe, but I judge that his idea is that the student in the latter part of his course in the medical college should elect what branch of medicine he is going to study, and fit himself for that. I do not like to allow that to go unchallenged, because I think we ought to bear in mind that the first thing essential to the education of a specialist is a thorough groundwork in medicine. No man should be a specialist unless he has first graduated in medicine and obtained the highest degree. We demand that the refractionists or optometrists shall not fit glasses because they are not doctors, then why should we take down the bars to somebody who seeks the higher education, it is true, but still who does not care to go through the grind of gynecology, obstetrics, etc., which he never intends to practice. These two courses are not compatible. If we demand a general medical education on the part of the refractionists and optometrists, we should also be willing to submit to the same dictum ourselves. No man, in my judgment, should become a specialist until he has first had a complete general medical education with all that that means, and has subsequently either practiced medicine for a certain number of years—I cannot say how long—in order to familiarize himself with the general principles of medicine and surgery, or, in lieu of that, has had an internship of eighteen months or two years in a general hospital.

Dr. George H. Price, Nashville: I was much interested in that part of Dr. Lancaster's paper in which he gave the number of hours to be devoted to various divisions of the subject of ophthalmology. If the number of hours laid down in this paper are devoted to ophthalmology alone, it becomes the major subject in the fourth year of every student, unless there is special provision, as suggested by Dr. Howe, for the purpose of allowing the man who has reached the third or fourth year to specialize along certain lines. The trouble is —and it has come into the teaching in every school—that every man holding a chair believes his subject to be the most important in the institution. There is no branch or chair in any institution so important to the ophthalmologist as ophthalmology. We have not time in a four-year course to devote to ophthalmology the number of hours suggested in the paper. The suggestions made by Dr. Allport and Dr. Howe are good. The time is coming when we cannot finish the medical course in four years. Now we have to supplement it with the A.B. degree before students enter; and in time we shall give four years to the general course, which is an absolute necessity, and then there will be one or two years devoted to special work in each department, to make men competent to practice any specialty.

Dr. Casey Wood, Chicago: In view of what Dr. Price has just said, may I ask Dr. Lancaster when he makes the statement that the study of physiologic optics should require three hundred to five hundred hours, whether he was talking of undergraduate or postgraduate study? It is not exactly clear to my mind.

Dr. Robert Sattler, Cincinnati: After spending a long time in the physiologic laboratories abroad and sharing at that time similar views to those so ably explained by Dr. Lancaster, concerning the necessity for better facilities of instruction in physiologic optics I returned with the determined purpose to afford advanced students in medicine and in particular those with a predilection for ophthalmology such advantages. I found, however, that this was an almost impossible task mainly owing to the passive interest and lack of preliminary training on the part of the student and after years of futile effort have since, with occasional exceptions, completely abandoned it as a purposeless undertaking. I advise every first and second-year man to take up the study of physiologic optics in connection with the work in physiology and have long urged that the hours devoted to the physiology of vision should be increased. I do not approve the teaching of physiologic optics to advanced students having no predilection for ophthalmology, but only for those who show a special bent, or who seek personally better opportunities for instruction in physiologic optics with the avowed purpose of selecting ophthalmology as a specialty after graduation.

Dr. Walter B. Lancaster, Boston: I am sorry that the two subjects should become confused—the undergraduate and the postgraduate teaching. If Dr. Price would add to the three hundred hours allowed for physiologic optics, the number for pathology, etc., I think he would see the impossibility of it as an undergraduate program. My paper was written to apply to the training of specialists. When we have a program arranged as I hope it will be by a competent committee, we shall see that five hundred hours is much too short a time to cover the whole subject of ophthalmology. Two years, I should think, would be the minimum, and one-half year, under my program, might be devoted to physiologic optics. With regard to elective work for undergraduates after the second year, I am sure Dr. Howe does not mean after two years but rather three or four. We are coming to the five-year course. After three or four years devoted to general medicine a man is ready to do some elective work in his future specialty. The planning of the course in medicine has been a matter of accretion. A great many things have been added to the science of medicine in the last twenty or thirty years, every one of which has been added to the curriculum. The result is that it is overburdened and the work is not effective. We must begin the process of elimination, and when we do that we shall find that we can leave out many unimportant chapters to make room for the more important ones. We cannot escape the law pointed out by Dr. Jackson. "How much we shall know about one thing depends on how much we are willing to be ignorant of about others."

SOME MODERN VIEWPOINTS OF GLAUCOMA

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Recent additions to the literature of glaucoma contribute less to its varied and many-sided clinical expression, or to the acknowledged completeness of its pathologic anatomy, than to the mystery of its origin. It is not so much the long-discussed question whether glaucoma simplex belongs in a category of its own, where the disclosures of my own experience must place it; or even that glaucoma, and in fact all its acute inflammatory expressions, are caused by blood stasis; for that a circulatory obstruction is the exciting feature has been held and believed by many investigators since Roser's time.

The more modern point of view concerns itself with the questions: (1) if in chronic, simple or non-inflammatory glaucoma, the accepted well-known sclerosis and rarefaction of the vascular and protective tissues (that is, the increased tension), is the first and actual dynamic factor and subsequently, after an inexorable but more or less uniform course, develops or excites the glaucomatous impulse, consisting of at present unknown intra-ocular biochemical changes, which, if not arrested, eventually and certainly lead to slow extinction of function: (2) if in all acute or more or less clinically so declared cases (in which, however, it is unerringly recognized as acute inflammatory glaucoma), these assumed biochemical intra-ocular changes must be considered the first or real dynamic factors, subsequently causing pathologic changes of sclerosis and rarefaction, or similar tangible ones, in the uveal and protective tunics. In other words, have we really convincing proof of the identity of the two forms of glaucoma, other than the more or less uniform increased tension, which they have in common?

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* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

Both the glaucomatous process and increased tension, if excessive and short or unduly prolonged, lead certainly to blindness. There is a difference, however, that in the acute declarations, blindness is often coincident with sudden high tension and certain prodromal symptoms. Later on or after an acute or subacute attack, a more or less similar pathologic anatomy is discovered, identical with, or at least closely resembling that which is early, almost constantly and uniformly, present in the chronic expressions, which have been so minutely studied and are so thoroughly understood. In the acute disease again, higher tension is always present. In the chronic disease it is lower and in some cases even in doubt. On this latter point we must await the confirmation of an assumed fact by the more reliable scientific disclosures of statistical tonometry, now furnished us by the Schiötz and Gradle tonometers. We know that an eye which develops or grows in response to normal nutritional impulses must and can adjust itself, through the inherent elastic property of its own protective tunic, to moderate increase above its normal tension. In illustration of this, let me refer to the investigations of Leber and Uribe y Troncoso, proving that the eyeball of an otherwise normal individual can adjust itself even to increased volume of its contents. If this important inherent compensating property of the protective and uveal tissues exists, it may be the natural safeguard against transitory or even increased hardness and fulness from various circulatory causes and will overcome natural hindrances and minor superimposed ones which the incoming and outgoing currents of blood and lymph produce. Thus it may equalize or spontaneously adjust the former, permitting a more or less perfect equilibrium or normal tension to be conserved; adequate nutrition and normal function are by this anatomic expedient mysteriously and perfectly balanced and a normal tension is maintained throughout life.

If, however, through developmental aberrations (mesoblastic deflections) of fetal existence, the elasticity of the globe, which we can assume at this period has a greater compensating quality through increased or latent resiliency of its larger blood volume, is not preserved because new or accidental anatomic impediments have been added to the natural circulatory ones, as structural aberrations on the part of the mesoblastic or vascular structures, then it will follow that they or the effects they produce are or become impossible of spontaneous adjustment. The equilibrium, so mysteriously and perfectly preserved until then, without such accidentally added new anatomic variations, for an adequate blood- and lymph-supply necessary to unimpaired functions after birth, will be upset or interrupted. We can reasonably assume that just so long as this compensating property of increased or reserve elasticity holds out, though nutrition and future functional activity both may suffer, they need not be seriously impaired until the globe yields, as it must and will, to the greater opposing force of lymph and blood obstruction and retention. Owing to the thinness and delicacy of tunic tissues, during fetal existence, globe distention, more or less retardation of ingoing (blood and lymph) currents, longer retention of increased blood volume, impedimental obstruction from compression of the larger sinus outlets within the globe or at their bends into the vortex-scleral canals, will now come to pass as next to coincidental happenings and we will have, after birth, the typical anatomic and clinical living illustration of congenital glaucoma.

If, instead of developmental causes, those which belong to senescence, or more commonly to remote periods of senility, become the active, exciting agents which interfere with or completely upset that mysterious equilibrium of a normal globe—now no longer histologically the same—which we call or recognize as normal tension and for which we now have accepted standards or readings through the scientific precision of tonometers, there will be presented a clinical picture even more complete, in its consecutive, objective anatomic changes, than we are able to observe in congenital glaucoma. As we all know, we shall then have enacted before us an almost orderly succession of pathologic causes and their clinical counterparts characterized by inexorable slowness, undermining, consecutively and permanently, nutrition and function. The most important structure anatomically and physiologically—optic nerve and retina—may for a longer or shorter time after this have preserved a certain tissue integrity barely sufficient for the merest display of function. The complete loss of this is, in many cases, followed by secondary pathologic changes of confirmed atrophic degeneration.

We note, in such cases, how first the normal resiliency of the globe is sacrificed. This is followed, sooner or later, except in a small number temporarily arrested by appropriate medicinal or surgical treatment, by the loss, on the part of the protective and uveal tunics, of every compensating property the eye has. We may assign this, as Henderson does, to the uveal tunic, that is, sclerosis of the pectinate ligament; or with Priestly Smith to peripheric overgrowth of lens dimension and consequent contraction of the circumlental region; or, with Leber, to pathologic changes at the iris angle blocking the outflow of the lymph in or near the spaces of Fontana and Schlemm's canal. Or we might reach conclusions of a host of other conscientious workers, who have suggested equally plausible and anatomically proved local abnormal tissue factors, which they have embodied in simple or complicated theoretical speculations. Each is entitled to greater or less recognition, as all offer a partial explanation of a wide and complete pathologic expression of an obscure first cause.

It has long appeared to me that acute glaucoma belongs in a category of its own. It is an intra-ocular tissue riot precipitated by a sudden choking of the entry of its blood- and lymph-supply, which, if not speedily relieved, destroys irreparably the function of the eye. Only those who know its pathologic anatomy or are personally familiar with the furious, almost cyclonic, course of its clinical declaration, can have more than an inadequate appreciation of what the true acute glaucomatous declaration stands for. It is known that the sudden appearance of inflammatory glaucoma depends on many exciting causes, which spring up as senescence and emotional life-experience proceed, decreeing at the same time different tissue and psychic changes for each individual. In some individuals (predisposed to glaucoma from intra-ocular congenital causes of anatomic origin which have always been present, but previously unsuspected and undeveloped, until the necessary exciting moment) there develops a true or unmistakable explosion of acute glaucoma following such exciting cause. A spontaneous recovery, though possible before through the compensatory qualities of more or less normal (juvenile) tissue, resiliency of the sclerotic and its lamina cribrosa, the entrance openings of arteries and veins and similarly surmised ones of the uveal tissues, is now no longer possible. It may well be asked if the unmistakable attack of an acute glaucoma is precipitated by the retention and acidosis of a larger volume of blood and lymph, in an assumed or actually more or less inelastic or sclerosed globe, with equally inelastic connective-tissue fabrics and senescent arteries and veins as well: and, with consequent deficient oxidation or other biochemical changes, if quasistrangulation of the globe is induced by congenital anatomic and acquired conditions as age proceeds, in consequence of this failure to absorb oxygen, creating, or directly responsible for the intra-ocular chemical changes which precipitate or usher in an acute attack.

One fact is established, that the beneficent achievement of surgery, the crowning professional discovery of Von Graefe, of a simple iridectomy made at the opportune time, executed with technical proficiency, will bring relief and save useful vision in most cases of acute inflammatory glaucoma, while its equally perfect execution with the greatest proficiency and the selection of the most opportune time will as certainly not accomplish this for chronic or non-inflammatory glaucoma.

Heerfordt's views, among the modern, are important because of his new anatomic discoveries pertaining to the vorticose sinuses of the chorioid and their intrascleral passage. In a complete and carefully arranged paper, Heerfordt states new anatomic facts and with amplified theoretical conclusions of older viewpoints (Stellwag, Roser) recites his own version of glaucoma. He defends the theory of Donders that glaucoma simplex is the prodromal stage of acute inflammatory glaucoma and asserts, accordingly, that two factors are concerned with the origin of the glaucomatous process, one being responsible for chronic or non-inflammatory and the other for acute inflammatory glaucoma. Furthermore, he assumes that non-inflammatory or chronic glaucoma depends on lymphostasis. He adds that lymphostasis rarely causes an increase of intra-ocular tension higher than 55 mm. Hg, and that it is definitely established that non-inflammatory glaucoma is arrested if an unobstructed outflow of lymph can be brought about.

He contends that the name "lymphostatic glaucoma" should be substituted for that of "non-inflammatory glaucoma." He holds to the view that the higher tension of inflammatory glaucoma cannot owe its origin to lymphostasis alone, but must have its own special cause and he finds this in the assumption that it is a hemostasis of the tunica vasculosa. He theorizes extensively on this point and adduces new anatomic facts which, more conclusively stated, are that the resulting hemostasis is brought about by folding or kinking of the walls of a larger vorticose sinus with compression at its internal point of exit and particularly within the lumen of its scleral passage or the vortex-scleral canal. He advances something new in the observation that the distended anterior ciliary blood-vessels formerly looked on as veins are in reality arteries. The following statement concludes his paper: "As so many recently discovered facts indicate that inflammatory glaucoma starts after hemostasis develops, as a complication of lymphostasis, it will be more correct to designate inflammatory glaucoma hereafter as lymph-hemostasis, or, briefly, hemostatic glaucoma, for the reason that it bears the imprint of hemostasis."

But the really interesting and profitable disclosures in Heerfordt's article center in his description of the painstaking anatomic examination of a glaucomatous eye, the numerous sections of which actually furnish tangible proof of assumptions commonly held since Roser's time (1859), of compression and valve-like obstruction in the larger emissary veins of the uveal tract. His microscopic sections demonstrate what has long been surmised, that a kinking or creasing of the walls of the vorticose veins actually takes place. This part of his communication is a welcome message for it supplements what Czermak, Birnbacher, Elschnig and others have established by means of less complete technical methods. Even that which is histologically new and of adjudged value, however, leaves much to speculation.

The older point of view of Donders, that glaucoma simplex is the prodromal or incipient stage of an acute inflammatory declaration, is again brought out by Heerfordt and made part of his version of glaucoma. While my experience does not refute this conclusion, it has more often appeared to me that the more or less acute exacerbations, which so rarely happen late in the course of glaucoma simplex, took place in broken-down arteriosclerotic subjects and could be assigned rather to secondary local and general nutritional degenerative changes than to a long-deferred expression of an acute attack of true inflammatory glaucoma.

Both simple and acute glaucoma have long appeared ontologically alike, but each represents to me a distinct clinical and anatomic phase during the longer or shorter course of which the character of one or the other is preserved. After one or the other has reached a relatively advanced or confirmed stage, with extinction of function, I have then observed, in exceptional cases, that a heretofore simple non-inflammatory case or one clinically declared as such, would take on new characters as the result of secondary, local nutritional causes, largely through the local and unchecked inroads of senility. These characters resemble, in their subjective and objective aspects, acute or more often chronic inflammatory glaucoma.

Acute unrecognized expressions allowed to become chronic may also, after a subsequent invasion of nutritional changes, assume objective clinical characters strongly resembling simple glaucoma owing to the spontaneous reduction of tension, absence of pain and local congestion. It is commonly admitted that a hypertonic globe may, exceptionally, more often after it has reached its confirmed state (glaucoma simplex and subacute inflammatory) again become normal and even hypotonic. I have seen this in cases of chronic inflammatory glaucoma but no similar instance of glaucoma simplex has come under my notice.

Senile and even presenile states make inflexible encroachments on the connective tissues and vascular structures of the eyes, and, together with similar ones which precede or accompany them throughout the body, leave their unmistakable imprint and sound the dominant note as fundamental anatomic and etiologic factors of glaucoma in general and simple glaucoma in particular. Individual peculiarities, optical errors, emotional tendencies, developmental and acquired predispositions, decree for some a special clinical picture and for others a many-sided one (inflammatory glaucoma).

It has certainly appeared to me that the distinctive or natural characters of glaucoma simplex were conserved as such throughout its long courses and that those of acute and subacute inflammatory glaucoma were also so preserved, yet were, on account of their many-sidedness, mistaken or not recognized because of the frequent and necessary variation of their original characters.

Clinically the kinship of congenital and senile simple glaucoma appears probable although the congenital cases may seem strikingly atypical when closely compared with those of senescence. We should not wonder at this if we call to mind the necessarily obscure and remote inception dating back to fetal existence or earliest infancy. Senility and fetal life impart, the former rigidity (sclerosis); the latter, resiliency to a more or less elastic globe. It is quite reasonable to assume, at least, that senility as it advances shows greater resistance and earliest infancy a less resisttance: that is, greater elasticity or stretching. We have the rigid, inelastic senile globe which Coccius, Stellwag and others assigned as a principal factor for the pathogenesis of glaucoma and we have equally positive proof of an excessively elastic or non-resisting globe in buphthalmos, which is the confirmed or absolute state of congenital glaucoma simplex.

The more uniform clinical picture and history of senile glaucoma simplex impresses this fact on me, that the discoverable pathologic changes of the eye grounds of circulatory retardation and obstruction are always in the foreground; and also, to a lesser degree, tissue rarefactions and sclerotic changes of the retina and optic nerve with similar changes of the central vessels suggesting reduction or even complete obliteration of caliber in their remote territorial distribution.

We can assume for most cases no other than a remote and obscure inception. We must acknowledge also that it is impossible to determine, even approximately, the length of time such pathologic changes as are noted have been in progress. But a larger insight and experience of the etiology and rational treatment of the disease may enable us to interpret intelligently and to glean a probable prognosis. We must carefully analyze, after eliminating other known causes for similar pathologic changes, in particular the more conspicuous ones of the nerve head, its color and depression, its central vessels, their caliber and light reflexes. And an even more difficult and uncertain task is to trace the vessels to their discoverable ramifications in the retina and from these ophthalmoscopic disclosures guess or infer whether the intercommunication between their arterioles and venous radicles is interrupted or retarded only. During a still more advanced progress, this inference is more certain for we can assume that the blood volume which passes through the central vessels is so minimized that it is sufficient for the barest display of useful function only, which can also be conclusively corroborated by perimetric and visual tests. The final or confirmed stage is reached amidst a painless progress, with fluctuating, moderate or greater tension, transitory betterment and failure of vision until its complete extinction is at hand. For a longer or shorter period after this, depending on the encroachments of age elsewhere and consecutive ocular ones, the structural but functionless integrity of the retina and optic nerve may be indefinitely preserved or, as not infrequently happens, such eyes may be invaded by secondary nutritional degenerations leading to a different clinical picture.

With a fuller knowledge of the pathologic anatomy and a larger clinical and surgical experience with glaucoma simplex, we must realize our helplessness, for even in spite of the most timely and carefully executed surgical treatment, most cases go to their doom. Many are even speeded toward a more rapid decline and others through the sudden and excessive relaxation of the operations (sclerotomy, iridectomy) lose, or suffer impairment of their already blunted central vision. We should all be governed in our advice for or against surgical interference by the mental and physical condition of our patient, even if functional tests still justify surgical interference, iridectomy, sclerotomy or its substitutes.

Gilbert, in an excellent paper, concludes his many practical and scientific generalizations with dependable advice as to surgical interference for glaucoma simplex. His paper also contains new facts pertaining to statistical tonometry and a just and fair analysis of Heerfordt's conclusions concerning the tonometric readings in so-called cases of lymphostasis and hemostasis. He also gives a lengthy account of venesection as a method of treatment during the prodromal stage of simple and inflammatory glaucoma, embodied in a carefully computed statistical report of cases observed at the Royal University clinic at Munich.

From my experience with glaucoma simplex, surgery is indicated only when an eye still possesses some of its natural or inherent compensating properties on the part of the sclera and uveal tunics. The main purpose of an operation, if these properties are not already lost, is to try to conserve and prolong them. If they are too much reduced or the globe is thereby too suddenly or too much relaxed, it will start secondary nutritional degenerations and, even amidst lower tension in some instances, more rapidly reach its final stage. Gilbert's advice on this point should be heeded by everyone whose experience with the various surgical measures which have been invented and practiced is limited, even though they may be indorsed and supported by common and individual experience.

The eyeball is tolerant of almost any carefully planned and executed interference, once it is in the grasp of advancing simple glaucoma, and it matters little whether the choice and judgment of an operator directs an iridectomy, sclerotomy, trepanation, cyclodialysis, iridotasis or an iridencleisis, if thereby he can only do a very little good; stay the final extinction of function and at the same time avoid doing more harm.

On the other hand surgery is as successful and beneficial now, for acute inflammatory glaucoma, as it was in the days of von Graefe and his followers. It is the same operation modified only by the acquired and natural proficiency of an operator. If executed in time on an otherwise healthy subject, in response to an unquestionable diagnosis, its next to successful result can be counted on.

If, after one or many subsequent subacute attacks, chronic glaucoma has been brought about through failure of the patient to seek competent advice or to follow that which was given, the operation, commonly attended by success, is more or less uncertain. When secondary or consecutive degenerations have invaded such eyes, surgery of every description sinks to the same level of ineffectiveness as is known to characterize it for simple glaucoma in its advanced course. For an acute attack not to be relieved through the right kind of surgery and at the right time, strongly suggests, with rare exceptions, that it was practiced on an incorrect diagnosis.

Though etiologically and pathologically it is not so different from other allied lesions, attended by higher intra-ocular tension, acute inflammatory glaucoma stands for me on a clinical territory of its own. It is through our own diagnostic shortcoming, however, that we become confused and confound a pseudoglaucomatous condition with a declaration of what only can or should be considered acute glaucoma. We have really not fully emerged from the benighted thought-period antedating the time of von Graefe and Roser. The latter, as is known, took the ground against the former that glaucoma was primarily due to cyclitis and for this anatomic reason claimed that the more correct latter term should be selected for it.

If, as claimed, glaucoma was due to cyclitis, with massive hemorrhagic and lymph exudates into the vitreous followed by sudden high tension and pain, ascribed to compression or valve-like closure of the veins of the chorioid and retina (Roser), this contention should not, in the light of larger knowledge since gained, arouse surprise. From that time to the present we have been called on to differentiate just such cases of pseudoglaucoma from the true glaucoma.

These conditions have only the cardinal symptom of high tension in common. This is transitory, however, and persists only until partial absorption of the massive exudates and hemorrhages into the vitreous and the anterior part of the uveal tract has taken place with release of pressure on the larger emissary veins of the uveal tract and retina, after which tension drops and pain subsides.

Except enucleation, which is not always expedient at once, surgical treatment commonly resorted to for the relief of high tension is of course unjustifiable and miotics either aggravate or act indifferently on the unalterable course which such affections take shortly after their inception.

Von Graefe, with a keener insight into the many-sidedness of clinical glaucoma and the broader viewpoint of a specialist, pointed out what was even then and certainly at present more fully known, that vitreous exudates and spontaneous rupture of retinal and chorioidal vessels is not a primary or even an infrequent happening during the early stage of glaucoma; he formulated and upheld his theory of serous chorioiditis with clear media and a visible fundus oculi.

If this point is clearly understood we can readily assume that a true attack of acute glaucoma may and often does take place in an eye without extensive intra-ocular vascular lesions. General cardiovascular lesions are present. Quite positively we can state that pseudoglaucoma, in its clinical declaration, is almost akin to its true expression, and happens more frequently as the result of hidden or unsuspected degenerations of the circulatory system of the eye, especially of the ciliary body, and almost without exception as part of the expression of pronounced general cardiovascular and renal causes. Its declaration is as precipitous as that of true glaucoma but there is a different antecedent history for the attack. In the rush and haste to operate, as high tension and excessive pain seemingly demand or call for this at once, we have all had the unpleasant revelation that our diagnosis proved wrong and that we had resorted to just that surgical interference which must fail, as it affords the degenerated blood-vessels of the ciliary body a better chance to pour forth uncontrollable hemorrhage, which speedy enucleation alone can check. For such cases, with an unquestionable diagnosis beforehand, there is but one course to pursue and that is to temporize, to relieve pain by anodynes and later, if indications demand it, to enucleate such eyes.

Martin Fischer published, several years ago, a remarkable book on edema and another on nephritis. His edema theory aroused wide-spread interest, among our number in particular, for the reason of its direct application to glaucoma. In common with others my interest was absorbed as his reasoning at last appeared to me to point in the direction of physiologic chemistry for a solution of the origin of glaucoma. As special workers, we accept his "colloidal theory" and the statement that "the cause of edema resides in the tissues." Almost uniformly favorable recognition has been accorded to it by physiologists in particular and the scientific public in general. As specialists, however, we cannot accept his conclusions on glaucoma until he furnishes more conclusive proof for them than that contained in his writings and lectures.

In Chapter VII., on edema of the special organs, under the heading, "The Nature and Cause of Glaucoma," the following statement, among others, is noteworthy for its singular point of view: "The most intense grades of glaucoma can be induced experimentally in an eye by the absence of any circulation;" but we are informed farther on that this happens in enucleated eyes *or after the death* of an animal. We are told that an eye (enucleated) becomes glaucomatous not "because fluid is pressed into it but because through changes in it it absorbs an increased amount of water"; also that "the amount of such absorption is sufficient to explain the severest grades of glaucoma ever observed clinically," etc. His own version of glaucoma is fully outlined on page 120. He furthermore says: "The best evidence in support of this colloidal conception of glaucoma is, however, not furnished by mere hypothetical discussions but by the following clinical observations;" he also makes the statement that "glaucoma is in the eye what we call nephritis in the kidney."

But can we admit a parallelism, for an analogy is hardly tenable, between an important excretory organ like the kidney and an organ of special sense of the physiologic importance and dignity of the human eye?

Nevertheless we can confidently assume that Fischer is among those who are forecasting the dawn of new discoveries in physiologic chemistry which may follow and which will aid in the solution of the mystery which still surrounds the origin of glaucoma.

Seventh and Race Streets.

EXPERIMENTAL STUDY OF INTRA-OCULAR PRESSURE AND OCULAR DRAINAGE

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The large number of failures in the treatment of glaucoma may be attributed to only one cause: our ignorance regarding the nature of this disease.

When Mackenzie and von Graefe declared, half a century ago, that the essence of glaucoma lies in the increase of intra-ocular pressure, they proclaimed only a small part of the truth. The increase of intra-ocular pressure is a symptom constantly accompanying glaucoma, but it is not the essence of glaucoma. Even the zealous researches of Knies, Weber, Priestly Smith, Laqueur, Brailey and others could not advance much further the problem relating to the nature of glaucoma. The general trend has been and still is to detect the ocular changes which produce the increased intra-ocular pressure in glaucoma, but little has been done in the direction of investigating the general causes which bring about these changes.

In the light of newer methods of investigation and of newer points of view, the question of normal and glaucomatous intra-ocular pressure must be reviewed and reinvestigated.

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* Because of lack of space, this article is abbreviated in The Journal. The complete article appears in the Transactions of the Section and in the author's reprints.

Let us ask ourselves the following questions:

1. What is the relation of the intra-ocular pressure to the rest of the organism? Is there any relation between the nervous or circulatory system and the mechanism regulating the intra-ocular pressure? Is there any relation between the ductless glands and the mechanism regulating the intra-ocular pressure? Does the blood in glaucomatous patients contain substances which have something to do with the disturbance of the mechanism regulating the intra-ocular pressure?

2. Is there any reflex action, which, starting from some part of the organism, strikes the equilibrium of the intra-ocular pressure?

3. Is there any interdependence between the intra-ocular pressure of both eyes? Does it rise or decrease in one eye, if it rises or decreases in the other eye?

4. What is the rate of drainage of fluids in normal and glaucomatous eyes?

5. Do the extra-ocular or intra-ocular muscles have any influence on the intra-ocular pressure and drainage?

6. Is the local treatment of glaucoma logical, limited, as it is at present, to reducing permanently the intra-ocular pressure?

The solution of the foregoing questions involves such an immense amount of clinical and experimental research that it is impossible for any single investigator to cover the entire ground. This paper relates the results of a series of experiments and clinical observations which were made by me during the past few years, having as a guide some of the before-mentioned problems.

DIMINUTION OF INTRA-OCULAR PRESSURE OBTAINED BY A CONSTANT PRESSURE ON THE EYEBALL (OCULAR DRAINAGE)

It has frequently occurred that, when two ophthalmologists palpate the same eye, the first examiner finds the intra-ocular pressure high, while the other pronounces it normal. With the Schiötz tonometer, we have the same experience. If the tonometer is applied on the eyeball several times consecutively, the instrument registers at the end a lower intra-ocular pressure than at the beginning. Having this in mind, I have tried to find out what happens if the tonometer is kept constantly applied on the eyeball for from 30 to 120 or more seconds. I found that in normal eyes the intra-ocular pressure invariably decreases during the time the weight of the tonometer presses on the eye, and that this amount of decrease may readily be made out by simply watching the indicator of the tonometer moving to the right one or more divisions of the tonometric scale.

How can we explain this reduction of intra-ocular pressure produced by pressure on the eyeball by the weight of the tonometer for a certain number of seconds? How may we designate this phenomenon? In a previous paper[1] I used the term "ocular drainage," and explained it by saying that "the weight of the instrument expresses a certain amount of fluid from the eye, thereby reducing its hardness." Further: "If by applying a weight on the eyeball it is possible to express from this organ a certain amount of fluid, it is evident that there are channels in the eye through which this fluid is expressed." As is known the Schiötz instrument indicates the amount of intra-ocular pressure by measuring the depth of the depression produced in the cornea by the weight of the rod of the tonometer. This depression is admitted by Schiötz to be in inverse proportion to the intra-ocular pressure; namely, the higher the latter, the smaller the former. But a more careful consideration of this subject and the experimental evidence brought out by Wessely[2] shows that the data obtained by the use of the Schiötz tonometer are based on (*a*) the elasticity of the cornea and sclera, (*b*) the intra-ocular pressure—and to this I should like to add (c) the condition of the draining-system of the eye.

The degree of elasticity of the cornea is a factor to be taken into account in our measurements of the intra-ocular pressure, because the cornea is not equally elastic in all human eyes. Furthermore, Wessely has found that in the eyes of cadavers the cornea changes in elasticity rapidly, and unless Schiötz gaged his instrument on fresh specimens, he included in his findings an element of some error. The degree of more or less rigidity of the sclera has also some influence on the depressibility of the cornea.

Another factor to be considered is the patency of the channels for the inflow and outflow of ocular fluids. When the tonometer is applied on the eye and the cornea is depressed, it is evident that the intra-ocular fluid (the aqueous) being not compressible, is displaced somewhere. The fluid could be either driven further back in the eyeball, producing a bulging at the opposite side, or it could follow the path of outflow of the aqueous and drain outside the eyeball. The latter possibility, drainage, is the most acceptable. The following test seems to prove this:

Applying the tonometer on a normal eyeball for about sixty seconds, we see that the intra-ocular pressure decreases gradually. If, after removing the tonometer from the eye for a few seconds, we again measure the intra-ocular pressure, we still find it lower than that obtained at the beginning of the first examination. If the ocular fluid were not expressed from the eyeball by the weight of the tonometer, it would come right back to its original position when the tonometer is removed, and the intra-ocular pressure should be found the same every time it is measured. Massage of the eyeball, which is but another form of pressure, also reduces the intra-ocular pressure for a few minutes by expressing some fluid from the interior of this organ. Tonometric findings, therefore, include not only the actual amount of intra-ocular pressure, but also the elasticity of the cornea and patency of the channels of drainage of the intra-ocular fluids.

If we admit that the gradual diminution of the intra-ocular pressure following the steady application of the tonometer on a normal eye for from 30 to 120 seconds is due to an expression of fluid from the interior of the eye, it is reasonable to conclude that the amount of fluid expressed and the degree of diminution of intra-ocular pressure are in proportion to the weight applied and to the patency of the channels of outflow. In this paper are given a series of measurements of both intra-ocular pressure and ocular drainage, the latter term meaning the rate of diminution of intra-ocular pressure when the eye is subjected to the constant pressure of the tonometer for a certain number of seconds.

The technic of measuring the intra-ocular pressure, which is familiar to the reader, is the same in human and in animal eyes. For the measurement of the ocular drainage, the tonometer is kept steadily applied on the eye, while the assistant looks at the watch. As the indicator moves 1 mm. to the right, showing that there is a corresponding decrease of intra-ocular pressure, the examiner announces this to the assistant, who marks down the number of seconds it took the indicator to move from one division to another. The tonometer is applied for from 30 to 120 seconds. Lately, I have simplified my method by marking down how many divisions the indicator moves to the right during from 60 to 120 seconds. I then read from the tonometric chart how many millimeters of mercury equal a given number of divisions. A detailed description of the method of examination may be found in my former paper.[1] The plan pursued in this paper for the examination of the intra-ocular pressure and drainage is as follows:

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[1] Schoenberg, Mark J.: Arch. Ophthal., March, 1913.

[2] Wessely: Ber. ü. d. 38 Versamml. d. Ophthal. Gesellsch., Heidelberg, 1912.

1. Rate of ocular drainage in normal rabbits.
2. Experiments regarding the relation between the intra-ocular pressure of *both* eyes.
3. Experiments and clinical examinations relating to possible reflexes or action of distant organs on the intra-ocular pressure.
4. Action of extra-ocular muscles on intra-ocular pressure.
5. Ocular drainage in normal human eyes.
6. Ocular drainage in glaucomatous eyes.
7. Ocular drainage in eyes in which glaucoma is suspected.

I. OCULAR DRAINAGE IN NORMAL EYES OF RABBITS

Numerous examinations of the ocular drainage made on the same rabbit have revealed the interesting fact that measurements vary more or less at every examination.

In one rabbit at the first examination, the tonometer having been kept applied on the right eye for 295 seconds, the intra-ocular pressure gradually fell 9 mm. Hg (from 22 to 13). At the second examination it went down 20 mm. Hg in 540 seconds, at the third examination 9 mm. Hg in 385 seconds, at the fourth examination 6 mm. Hg in 420 seconds, and at the fifth examination 9 mm. Hg in 376 seconds.

The same kind of apparent irregularities in the measurements of ocular drainage was obtained in about ten rabbits. It seems logical to expect that the same tonometric weight, applied on the same eye, should reduce a constant amount of intra-ocular pressure in a given *number of seconds*, but this was not found to be the case.

The only constant factor in all the examinations made was that the intra-ocular pressure was reduced every time the tonometer was kept steadily applied on the eye for a given time.

II. POSSIBLE RELATION BETWEEN THE INTRA-OCULAR PRESSURE OF BOTH EYES

C. Hess[3] found in a curarized monkey that if an electric stimulus was applied on one eye, while cannulas connected with a manometer were introduced in the anterior and posterior chambers of both eyes, the intra-ocular pressure fell uniformly in both eyes and rose again after the stimulus was discontinued. No difference in the tension of the stimulated and non-stimulated eyes could be detected. Hess thinks that the change of intra-ocular pressure in both eyes was not due to the contraction of the intrinsic muscles, but to a change in the blood-pressure.

In another monkey the stimulation of one eye caused a slight increase of intra-ocular pressure in both eyes.

The ingenious experiments of Hess show that in monkeys it is possible to change the intra-ocular pressure of one eye by stimulating the other. I have studied the question whether there exists an inter-relation of the intra-ocular pressure in the two eyes by measuring the tension in both eyes before and after massage or suction has been applied on one eye only and found that (1) the suction and massage reduce the intra-ocular pressure in eyes with a normal tension; (2) in eyes with a normal intra-ocular pressure the suction of one eye reduces very frequently the intra-ocular pressure of both eyes; rarely the intra-ocular pressure remains the same or becomes a little higher in the non-treated eye; (3) in glaucomatous eyes suction seems to have little influence on either the treated or the non-treated eye; (4) tests made on two cats under general anesthesia (ether) showed that heavy pressure and massage exerted on one eye does not change the intra-ocular pressure in the other eye.

IV. EXPERIMENTS AND CLINICAL EXAMINATIONS REGARDING THE EXISTENCE OF A REFLEX ACTION OF SOME DISTANT ORGANS ON INTRA-OCULAR PRESSURE

Although it is accepted as an established fact that in normal eyes the degree of intra-ocular pressure depends on the height of blood-pressure alone, and on no other factor,[4] I have tried to find out whether mechanical or electrical irritation of various organs in animals may change the intra-ocular pressure, and found that the mechanical irritation of the liver, spleen, kidneys, intestines and peritoneum did not produce any change in the intra-ocular pressure. If we noticed, during the experiment, a reduction of the intra-ocular pressure, it was due rather to the bleeding and shock accompanying the opening of the abdominal cavity. In the first and second cats in which respiration had stopped, the mechanical stimulation of the abdominal organs and the electrical stimulation of the brain could not elicit any reflex action on the intra-ocular pressure. Whether the regularly recurring increase of intra-ocular pressure after mechanical irritation of the sexual zone in the third animal was due to a real reflex or to a reflex contraction of the ocular muscles, or to a reflex vasomotor action of ocular muscles, I am not prepared to say.

I instituted similar examinations of human subjects. I had the good fortune to be allowed by Dr. A. A. Berg to measure the intra-ocular pressure in patients before and after various abdominal operations at the Mt. Sinai Hospital. Excisions of large portions of the stomach, intestines, of the gall-bladder, thyroid, kidney, etc., are more or less mechanical irritations to these organs and the intra-ocular pressure was examined before and after such operations with the purpose of establishing whether it changes during such operations.

TABLE 2.—SUMMARY OF CASES IN WHICH INTRA-OCULAR PRESSURE WAS MEASURED BEFORE AND AFTER *OPERATION*

		I.-O. Pr. Before Operation		Duration of Operation Minutes	I.-O. Pr. After Operation	
Case	Diagnosis	O. D.	O. S.		O. D.	O. S.
9	Cholelithiasis	22	26	13	22	26
10	Fracture of humerus	30.5	30.5	15	36.5	36.5
11	Cholecystitis, lithiasis	22	....	20	30.5	...
12	Hernia inguinalis	22	22	10	26	26
13	Hernia femoralis	18.5	....	40	26	26
14	Chronic cholecystitis	22	22	15	36	36
15	Fracture of humerus	26	..	47	30	..
16	Carcinoma of stomach	22	22	68	26	30.5
17	Fecal fistula	26	26	58	26	26
18	Mesenteric lymphosarcoma	18.5	26	15	18.5	26
19	Acute appendicitis	26	26	10	30.5	26
20	Skin graft of leg	22	26	20	18.5	22
21	Carcinoma of stomach	16	16	15	18.5	18.5
22	Carcinoma of pylorus	22	22	48	18.5	18.5
23	Inguinal hernia	27	27	60	32	32
24	Exophthalmic goiter	30.5	22	70	41	32
25	Renal calculus	...	..	45	42.5	36
26	Iridocyclitis, O. D. enucleated	...	26	20	....	22

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[3] Hess, C.: Arch. Ophthal., xl, No. 2.

[4] Leber: Handbuch der gesamten Augenheilkunde (Graefe-Saemisch), ii.

In all the adult patients, the anesthesia was begun with nitrous oxid for a few minutes and continued with ten minutes after the beginning of the anesthetic, and ether. The intra-ocular pressure was measured about at the end of the operation. I concede that this series of examinations is not free from objections. It may be noted as a known fact that ether anesthesia increases the intra-ocular pressure; the almost regular increase of intra-ocular pressure, therefore, which was found in this series of examinations, must be attributed to the administration of this anesthetic. The variations in the increase or decrease of intra-ocular pressure in these cases may be due to a fusion of several causes, as the variations of the blood-pressure during the operation, the changes in the function of the glands with internal secretion, nervous reflexes (?), etc.

In thirty-two eyes examined before the operation, three showed an intra-ocular pressure above 26 mm. Hg. (the normal upper limit); while after the operation (lasting from five to seventy minutes), the intra-ocular pressure was above the normal limit in fourteen eyes.

Considering the findings of my experiments on cats, examinations along this line must be made in a large number of cases before any conclusion regarding this question may be reached.

V. RELATION OF INTRA-OCULAR PRESSURE AND DRAINAGE TO THE TONUS OF THE EXTRA-OCULAR MUSCLES (MUSCULI RECTI AND MUSCULI OBLIQUI)

It is a well-known fact that external pressure on the eyeball raises the intra-ocular pressure. During the time the tonometer is applied on the eye, a slight pressure with the finger or a faint attempt to close the lids is sufficient to modify the tonometric measurement, and a high intra-ocular pressure is recorded.

The four musculi recti and two musculi obliqui, besides their main function of moving and rotating the eyeball in all possible directions, exert a certain pressure on the eye by the constant muscular tonus, which is inherent to a normally acting muscle.

Considering that the slightest external pressure on the eyeball could change the intra-ocular pressure, it is reasonable to suppose that extra-ocular muscles constantly act on the normal level of intra-ocular pressure by fluctuating its height within certain limits.

Wessely[3] has seen that in monkeys the intra-ocular pressure rises whenever the eyeball is moved. He found in a human eye with melanosarcoma before enucleation an increase of intra-ocular pressure of 5 mm. Hg every time the eye moved.

From a short perusal of some of the important contributions to the subject (Adamück, von Hippel, Grünhagen, Parsons, etc.) we may safely conclude that Leber's dictum "the intra-ocular pressure depends on the blood-pressure alone and on no other factors" ought to be modified. I am certain that the extra-ocular muscles have also something to do with the normal balance of the intra-ocular pressure.

My experiments on rabbits seem to corroborate the foregoing statement. In these experiments the intra-ocular pressure has been measured repeatedly on each rabbit; the insertions of the ocular muscles were severed, and the intra-ocular pressure and ocular drainage again measured the same day of the operation and on several days following cocain was used as a local anesthetic. The intra-ocular pressure fell considerably for several days after the tenotomies.

The decrease of intra-ocular pressure following the tenotomy of all the ocular muscles could be attributed to each of the following causes or to all of them:

1. The section of ciliary vessels and bleeding during the operation.
2. The action of the cocain and epinephrin.
3. The retraction of the ocular muscles and the temporary suspension of their tonic pressure on the eyeball.

The first two causes could not account for the persistence of the decrease of intra-ocular pressure for several days, since we know that the effect of cocain and epinephrin wears off in a short time, and the bleeding accompanying the tenotomies stops as soon as the conjunctival stitches are applied at the end of the operation.

VI. RATE OF DRAINAGE IN HUMAN EYES WITH NORMAL INTRA-OCULAR PRESSURE

If the tonometer is applied for from sixty to one hundred and twenty seconds on an eye with a normal intra-ocular pressure, we may see how the indicator is gradually moving a few divisions to the right. I have measured this gradual diminution of intra-ocular pressure in thirty-one eyes (some of them with optic atrophy, others perfectly normal) and found that in rabbits' eyes, the time required for a given amount of intra-ocular pressure to descend a certain number of millimeters of mercury is not the same in all patients. Furthermore the same eye does not show the same rate of diminution of intra-ocular pressure when examined at various intervals. For instance, in one patient, at the first examination the intra-ocular pressure of the right eye went down from 26 to 10 in 120 seconds, while at the second examination it decreased from 26 to 18.5 in 120 seconds.

The rate of diminution in thirty-one eyes is shown in Table 3.

TABLE 3.—RATE OF DIMINUTION OF DRAINAGE IN THE EYES OF FOURTEEN PATIENTS WITH NORMAL INTRA-OCULAR PRESSURE

No. of Eyes	Intra-Ocular Pressure mm. Hg.	Diminution Shown By Drainage Test	
		Maximum mm. Hg.	Minimum mm. Hg.
2	26	16	7.5
2	22	6	3.5
3	18.5	7	5.0
8	16	6	5.5
8	13	8.5	3.5
6	11.5	5.0	1.5
2	10.0	3.5	3.5

Though the number of eyes examined is very small, Table 3 is of some value for orientation at least. I cannot say yet whether a certain given rate of diminution of intra-ocular pressure during 60 or 120 seconds in a certain eye is normal or abnormal because it does or does not correspond to the data in the table. For that purpose thousands with a normal intra-ocular pressure must be examined. For the present, I can only give my impression that the rate of drainage is smaller in eyes with a normal high (near 26 mm. Hg) intra-ocular pressure. There must be a minimum rate of ocular drainage for a normal eye. An eye which has less than that minimum rate is abnormal and most probably has glaucoma, no matter what its intra-ocular pressure may be.

VII. RATE OF DIMINUTION OF INTRA-OCULAR PRESSURE ([illegible]AR DRAINAGE) IN GLAUCOMA

Admitti[illegible]e gradual diminution of intra-ocular pressure [illegible]re exists a[illegible] the steady application of the tonometer is due[illegible]xpression of fluid from the interior of the eyeball, [illegible] is logical to suppose that in cases in which the rate of diminution of intra-ocular pressure is smaller, the channels through which the intra-ocular fluid may be expressed are more or less obstructed. And vice versa, knowing that the entire pathology of glaucoma points to a partial or total obstruction of the paths of ocular outflow, we may reasonably deduce that our test will show a diminished rate of ocular drainage.

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[3] Wessely, K.: Ber. u. die 38 Versamml. d. Ophthal. Gesellsch., Heidelberg, 1912.

OCULAR DRAINAGE IN PATIENTS WITH ABSOLUTE GLAUCOMA AND GLAUCOMA WITH HIGH INTRA-OCULAR PRESSURE

Case 41.—O. D., absolute glaucoma; O. S., aphakia, chronic glaucoma.

Ocular drainage: O. D. 86; no change in 120 seconds. After the use of pilocarpin drops for several days, O. D. 86; no change in 120 seconds.

As was to be expected, in all the cases of this character (nine) the intra-ocular pressure did not recede when the tonometer was kept constantly applied on the eyes for *from 60 to 120 seconds.* The obstruction in the drainage system in eyes with absolute glaucoma (angle of anterior chamber, canal of Schlemm, vorticose veins, etc.), is advanced to such a degree that no fluid can be expressed by the weight of the tonometer.

VIII. OCULAR DRAINAGE IN EYES IN WHICH GLAUCOMA IS SUSPECTED

This patient did not complain at all about her left eye on her visits to the clinic. The first examination of the left eye revealed that the ocular drainage was at a minimum as compared with ocular drainage of normal eyes with the same intra-ocular pressure (table of ocular drainage in normal eyes). The fact that the intra-ocular pressure remained at 18.5 while the tonometer was applied on the left eye for fifty seconds made me suspicious of the condition of this eye. That the suspicion was well founded was proved by the second examination, just before an iridectomy was performed on the right eye. At this examination, both the high intra-ocular pressure and the obstruction of ocular drainage confirmed the diagnosis of latent glaucoma. It is very important to mention that the left eye developed symptoms of acute glaucoma a few weeks after the iridectomy of the right eye.

Case 65.—L. B., aged 65 years. O. D., absolute glaucoma. O. S., suspicious glaucoma. During the two years the patient was under observation, she complained of occasional blurring of vision in the left eye. Examination revealed nothing abnormal.

August 6: Ocular: O. D.

March 2, 1912: Ocular drainage: O. D. 60; no change after 50 seconds. O. S. 26. After 10 seconds, 22. *After another 65 seconds, no change.*

April 10, 1912: O. S. 18.5. After 60 seconds, no *change.*

Several more examinations of the ocular drainage of the left eye gave similar results: a relative impairment in the *rate of* ocular drainage, and though the examination of the fundus of the acuity of vision, and of the field of vision (roughly taken on account of the extreme nervousness of the patient) together with the normal intra-ocular pressure, were against the diagnosis of glaucoma, *I could not regard* the eye as normal on account of the reduced ocular drainage. Jan. 22, 1913, I was called to the patient's home and found an acute glaucoma of the left eye. Intra-ocular pressure was 42.5. V. = movement of hand. Cornea steamy, pupil immobile and dilated. This condition confirmed my former suspicion that the patient's left eye was in stage of prodromal or rather latent glaucoma, all the time she was under observation, and that the rel to change in the rate of ocular drainage came as a ating the the intra-ocular pressure rose high a re exists an inter-relation of e two eyes by measuring the

(IX. GE) gradual d the steady pression cal

Case 66.—J. H., age Mount Sinai Hospita , No. 2.

suffered from headaches for about three months and that the pains were most severe around the left side of the forehead and temple. She sometimes saw various colors around the gas-flame.

Ocular drainage: O. D. 22. After 15 seconds, 16. After 60 seconds, no change. O. S. 26. After 60 seconds, 22. After 60 seconds, no change.

The rate of ocular drainage in these eyes did not seem to be quite normal. After two weeks, during which time she was using pilocarpin drops in the left eye, a second examination of the ocular drainage was made: O. D. 16. After 35 seconds, 13. After 25 seconds, 11.5. O. S 22. After 65 seconds, no change.

As we see, the rate of ocular drainage remained abnormal in the left eye, and the intra-ocular pressure did not decrease very much under the influence of a miotic.

At several examinations of the left eye at various periods, we found a lower capacity of drainage and a slightly higher intra-ocular pressure than in the right eye.

From my point of view, the fact that the intra-ocular pressure was found constantly higher in the left eye than in its partner, and also the circumstance that the rate of ocular drainage was partially impaired, spoke in favor of glaucoma.

If any conclusion is to be drawn from four cases of suspicious glaucoma it is the following: *The diagnostic value of a so-called normal intra-ocular pressure is only relative.* In these four cases the intra-ocular pressure was found normal, and still two of them developed symptoms of acute glaucoma. Is the impairment of ocular drainage of a diagnostic value, independent of the height *of the intra-ocular pressure?*

The following case should serve as a proof of the relative independence of the ocular drainage and the height of intra-ocular pressure.

Case 67.—M. L., aged 38 years, cutter of cloaks. Both eyes, simple glaucoma; O. S., coloboma iridis artefactum.

June 1, 1912: O. D. 50.5, O. S. 30.5. As the use of pilocarpin, 2 per cent., 1 drop four times daily, did not reduce the intra-ocular pressure, the patient was directed to instil the miotic every hour in both eyes.

Examination of the ocular drainage, seventeen days later: O. D. 27; no change during 120 seconds. O. S. 22. After 32 seconds, 18.5. After 72 seconds, 16.

As we see, the miotic succeeded in reducing the intra-ocular pressure in both eyes to a degree "within the normal limits," but it did not act in the two eyes in the same manner. In the left eye both the intra-ocular pressure and the ocular drainage were normalized, while in the right eye, the ocular drainage remained impaired although the intra-ocular pressure became normal.

SUMMARY

The study of the ocular drainage has revealed the following:

1. There is always a gradual reduction of intra-ocular pressure if the tonometer is applied on a normal eye for a certain number of seconds.

2. *The rate of reduction* of intra-ocular pressure varies not only in various eyes, but also in the same eye if taken at different periods.

3. Experimental evidence seems to indicate that changes of intra-ocular pressure in one eye may often be followed by similar changes of intra-ocular pressure in the

	26	10	18
	22	26	
or stomach	16	16	
Carcinoma of pylorus		22	
4/ Inguinal hernia			
Exophthalmic goiter			
25 Renal calculus			
26 Iridocyclitis, O. D. enucleat			

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4. Leber: Handbuch der Saemisch), ii.

important rôle in the various normal fluctuations of the intra-ocular pressure.

5. The ocular drainage in glaucomatous eyes differs from that of normal eyes. The slower the rate of drainage, the nearer the eye is to an acute attack or to absolute glaucoma; the more rapid the rate of drainage, the nearer to a state of compensated glaucoma. *A reduction of the rate of ocular drainage may mean latent glaucoma in spite of an intra-ocular pressure which is within the normal limit (below 26 mm. Hg).*

The continuous fluctuations in the intra-ocular pressure and ocular drainage in normal eyes, the relative dependence of the intra-ocular pressure on the general blood-pressure, and of the latter on the ductless glands, and the probable relation existing between the intra-ocular pressure of both eyes, suggest that the present tendency of devising all possible operative procedures for the relief of intra-ocular pressure in glaucoma is only a palliative measure. It is not logical. The essence of glaucoma is not an increased intra-ocular pressure just as a high blood-pressure is not the essence of arteriosclerosis.

I wish to thank Drs. J. Maller and D. Halle for their assistance in my animal experimentations and Drs. J. Mills, O. Schirmer, H. Tyson and A. A. Berg for their kindness in permitting me to examine also some of their patients at Dr. Knapp's New York Ophthalmic and Aural Institute and Mount Sinai Hospital.

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HYDROPHTHALMOS

WITH A HISTOLOGIC REPORT OF TWO CASES, ONE OF WHICH PRESENTED A CONGENITAL COLOBOMA

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In the spring of 1912 there occurred in my clinic at Wills' Hospital that curious coincidence occasionally noticed by every clinician, of seeing within a short period of time several cases of an uncommon affection. In this instance it was hydrophthalmos, and the coincidence was even more striking in that all three cases were in negroes.

As I could recall seeing but six cases of this disease and as four of these occurred in negroes, in two of which there was a strong suspicion of hereditary syphilis, it seemed as if this might be more than an accidental association. With this thought in mind and with the recollection of an unfortunate outcome to the operative treatment by different methods and by two different operators of the eyes of a baby presenting a marked degree of hydrophthalmos, it was believed that it would be of value to collate the opinion of others as to the etiologic relationship of race and syphilis to this disease, and also their experience in the treatment of this condition.

The unusual opportunity of making a histologic study of an eye with a congenital coloboma which developed hydrophthalmos presented itself and the findings though incomplete are deemed of sufficient interest to publish.

SYMPTOMS

A brief description of the affection will here be given in order to recall to mind the conditions to be taken [illegible]to consideration in a discussion of its treatment. [illegible]rophthalmos (buphthalmos, congenital glaucoma) is [illegible]ion due to intra-ocular hypertension probably [illegible] anomalies of development or of prenatal [illegible]terior segment of the eyeball. The striking contrast between the effects of hypertension in the juvenile eye and the adult eye is to be explained by the greater elasticity of the tissues of the young eye.

Some evidence of the disease is usually present at birth or makes its appearance within the first six months of life. Collateral and direct heredity has been traced in some instances. The disease is more often bilateral than unilateral and occurs with somewhat greater frequency in males. It is characterized by a uniform distention of the globe. The cornea becomes greatly enlarged and thinned and usually cloudy; dark lines appear in the hazed area due to tears in the membrane of Descemet. The anterior chamber becomes very deep because of the increased size of the cornea and the recession of the lens and iris. The iris is often tremulous and may be rent, more often at the ciliary attachment. It may be rudimentary or present a coloboma. The distention of the perilental structures causes the suspensory ligament to stretch and tear and thus is brought about a partial or complete luxation of the lens into the vitreous or anterior chamber. The lens is either normal or undersized. The sclera becomes thinned and appears bluish because the underlying chorioid and ciliary body show through. Notwithstanding the decided lengthening of the axis of the globe, the degree of the myopia is usually not very high, indeed occasionally the refraction is hyperopic. The chorioid and retina become thinned and atrophic and the optic disk cupped. If the hypertension is not reduced the distention of the globe becomes extreme, the eye becomes irritable and painful and may rupture spontaneously; or because of its protrusion and amaurosis, it is liable to injury and is ruptured as the result of a blow or ulceration. In some instances the tension diminishes spontaneously and the distention of the globe is permanently arrested. This usually does not take place until the process is advanced and the eye blind, but occasionally it occurs early enough for the preservation of useful vision. Among the more unusual associated conditions and complications are plexiform neurofibroma of the lids, congenital anomalies either of the eye or other parts of the body and ulceration of the posterior surface of the cornea secondary to iridocyclitis. At times the haze of the cornea is the first symptom to appear and leads to the belief by some that it is also the initial pathologic change, resulting in an anterior uveitis culminating in a secondary glaucoma.

ETIOLOGY AND PATHOGENESIS

Schmidt-Rimpler sees no reason to assume that hereditary syphilis exercises an influence in the origin of hydrophthalmos although he points out that, in the parenchymatous keratitis of congenital syphilis, hydrophthalmos does develop and states that a large percentage of Seefelder's cases occurred in families in which diseases of various kinds resulting in death in childhood was the rule.

There is much the same controversy here as in glaucoma of the adult relative to cause and effect of the various anatomic changes found. In one of the most recent and exhaustive anatomic studies of infantile glaucoma, Magitot concludes that there are two classes of cases, one in which there is little or no inflammatory lesion, including very few cases. These show an obliterating endophlebitis, of the emissary scleral vessels and some of the anterior ciliary veins. When such lesions are absent there exists an aplasia of the venous system of the angle, and thus Schlemm's canal is absent. Perhaps all our other congenital anomalies are due to some infection or irritation transmitted through the maternal placenta.

The other class of cases is characterized by inflammatory lesions; these are common but of *variable intensity*. The slightest cases affect the venous system of the angle, then the retinociliary region and chorioid become affected, while in the most intense cases the whole of the uveal tract and the vorticose veins are attacked. He believes that the vascular inflammatory lesions are the cause of the increased tension in infantile glaucoma, and that it is not necessary to suppose an obstruction to the outflow of the aqueous humor. He suggests the existence of a posterior glaucoma from obstruction to the vorticose veins and an anterior glaucoma from that of the emissary ciliary veins.

Schoen believes the cause to be a congenital absence of the meridional fibers of the ciliary muscle which in the normal eye, by their elasticity, intercept the intra-ocular pressure from immediate impact on the elastic sclera. Heine, having found a striking thinning of the anterior scleral zone, concludes that there is a deficient resistance at that point, and Abadie likewise locates the primary cause there in the form of a retinochorioiditis. In connection with the views expressed by these two authors it should be borne in mind that Erdmann in experimental glaucoma of rabbits found a primary atrophy of the chorioid and retina exactly limited to the anterior segment of the eye due to the increased pressure. Von Hippel believes it to be due to a fetal disease of the cornea. Collins' views are based on the study of several hydrophthalmic eyes. He found in some cases a prenatal condition of the ligamentum pectinatum—a network of fibers filling up a space at the angle of the anterior chamber, which in the normal fully developed eye is part of the anterior chamber—and to him it seems probable that the persistence of this prenatal state of the ligamentum pectinatum is responsible for obstructed exit of fluid from the eye, and the occurrence of increased tension. De Lapersonne espouses the theory of Angelucci and Galleinga which is predicated on a congenital disturbance of circulatory equilibrium of the interior of the eye. He has observed in the vasomotor ataxia of Cohen, whatever may be its cause, a vasodilatation with hypersecretion explaining all of the symptoms of hydrophthalmos; and has actually seen cases associated with the vascular disturbance of Basedowian type. A like observation is attributed to Angelucci. Reis, who made a pathologic study of seven buphthalmic eyes, found no pathognomonic constant finding. In four of his cases the angle of the anterior chamber was open; in two of these there was complete absence of the canal of Schlemm. Parsons concludes that, whatever be the exact mechanism, it would seem certain that there is a very definite obstruction to the filtration of lymph from the eye at the angle of the anterior chamber. Whether this is due to a congenital arrest of development or to an intra-uterine or an early extra-uterine inflammation, must, in his opinion, be left an open question. He adds that even an arrest of development must have some cause, and that this is most probably to be discovered in some intra-uterine inflammatory or toxic condition. Magitot has expressed the same thought. Stimmel and Rotter describe the conditions found in three buphthalmic eyes studied by them. In the first case the canal of Schlemm was entirely absent; the ciliary muscle had a fetal structure and the iris and ciliary body were abnormally developed. There was also rupture of Descemet's membrane, hemorrhages into the retina and chorioid, detachm
retina, old thrombosis of the central vein
thrombosis of the inferior vorticose
two cases showed absence of the ca

rupture of Descemet's membrane, chronic iridocyclitis and slight atrophic excavation of the optic papilla.

They state that the consensus of opinion is that the disease is caused by an absence, entire or in part, of the canal of Schlemm, which is placed abnormally far back; in the persistence of temporary fetal connective tissue in the angle of the anterior chamber, and in an insufficient separation of the iris from the cornea.

TREATMENT

The proved value of iridectomy, in glaucoma of the adult, has undoubtedly been the reason for its selection by many operators in treating the congenital type. Yet the anatomic conditions and the topography of the parts are so different in the two types that what is a safe and satisfactory procedure for the one becomes a dangerous and disastrous procedure when performed for the other. This operation has the support, however, of a number of surgeons of large experience. Thus Hirschberg reports a case in which sixteen years after the operation tension was normal. There were macular changes, a flat excavation of the nerve-head and a high myopia.

In Schoen's interesting case in which iridectomy still controlled the process after twenty years a cystoid cicatrix had resulted, the cyst being almost as large as the globe.

Schoenemann reports seven cases permanently arrested. He does not consider the operation dangerous if performed early and after the method of Schweigger.

Schmidt-Rimpler evidently does not share this view. He quotes von Graefe to the effect that "in the vast majority of cases the disease remains a *noli me tangere* and adds that he has unfortunately too often seen the eye lost after iridectomy—"it did indeed become smaller, but from phthisis bulbi."

Fuchs emphasizes the dangers of iridectomy but adds that a series of favorable results have been obtained. Among the surgeons so reporting are Angelucci, Swanzy and Bergmeister. Haab states that if posterior sclerotomies are begun early enough infantile glaucoma can be cured. Stölting also advises this operation repeated so long as tension remains increased.

Schmidt-Rimpler sums up his study of the literature and the results of his own experience advising that, in advanced cases and in bilateral cases, only one eye be operated on and the result observed, in the meanwhile using miotics in the fellow eye. He is definitely of the opinion that these drugs at least delay the progress of the process.

EXPERIENCE OF THE PROFESSION WITH OPERATIVE PROCEDURES

The following questions were sent to a large number of ophthalmic surgeons throughout the country:

1. What operative procedures have you tried? 2. What have been the results? 3. Do you now favor operative treatment? 4. If so, what is your operation of choice? 5. What per cent. of cases showed evidences of inherited syphilis? 6. What was the percentage of cases in negroes?

syphilis is a factor in its causation the affection would probably have been seen more frequently in this race.

The replies obtained to the preceding questions are arranged seriatim:

ROY: 1. Repeated paracentesis of the anterior chamber with iridectomy. 2. Very poor. 3. Yes. 4. Same as 1. 5. Almost 10 per cent. 6. Majority in negroes.

FOX: 1. Iridectomy and sclerotomy. 2. Failure. 3. Yes. 4. Enucleation and Mules' operation. 5. None. 6. Low.

WOOD, C.: 1. Iridectomy (ten eyes). 2. Encouraging. 3. Yes. 4. Sclerectomy (trephine), large opening. 5. Twenty-five per cent. 6. Ten per cent.

DE SCHWEINITZ: 1. Repeated sclerotomy. 2. Unsatisfactory. 3. Miotics failing. 4. Either repeated posterior sclerotomies or trephining. 5. ? 6. None.

MANSON: 1. Galvanocautery to apex of cornea. 2. ? 3. ? 4. ? 5. None.

WESCOTT: 1. None. 2. ? 3. Yes. 4. Iridectomy, 5. ? 6. None.

CHANDLER: 1. Paracentesis. 2. Poor. 3. No. 4. —. 5. ? 6. None.

WILDER: 1. Iridectomy, anterior sclerotomy, excision of the superior cervical sympathetic ganglion, trephining sclerectomy. 2. Immediate results fair. 3. No benefit in the ganglion extirpations. Ultimate results judged to be not good in the majority of cases. 4. Sclerectomy or trephining. 5. ? 6. None.

VERHOEFF: 1. Lagrange, sclerotomy. 2. Excellent in the immediate results. In two cases with advanced changes in which sclerotomy could not be performed, sclerectomy was followed by intro-ocular hemorrhages. 3. Yes. 4. Sclerotomy. 5. ? 6. None.

BRUNS: 1. Iridectomy as for glaucoma. 2. Good. 3. Yes. 4. If seen early glaucoma iridectomy in one eye; treat other eye with miotics. 5. One suspicious. 6. ?

MAY: 1. Iridectomy, three cases. 2. Beneficial for tension and comfort. Vision poor to start with. 3. In suitable cases. 4. Iridectomy. 5. ? 6. None.

WOODS: 1. Iridectomy and enucleation. 2. Two cases with iridectomy; progress arrested. 3. No, unless pain and increased tension present. 4. Iridectomy or similar operation. 5. ? 6. ?

WEEKS: 1. Iridectomy and trephining, after Elliott. 2. Iridectomy not encouraging: trephining sufficient to warrant further trial. 3. Yes, in favorable cases. 4. Trephining. 5. ? 6. Twenty per cent. (one case good result—two years with 1 per cent. pilocarpin locally).

WEBSTER: 1. Iridectomy. 2. Failure. 3. ? 4. ? 5. ? 6. None.

KNAPP: 1. Cyclodialysis; Lagrange without iridectomy. 2. No beneficial results. 3. Where cornea is dull, in lesser grades, pilocarpin. 4. Trephining. 5. None. 6. None.

CALLAN: 1. Iridectomy. 2. Unsatisfactory. 3. Yes. 4. Sclerectomy—punch or scissors. 5.? 6. None.

HARLAN: 1. Iridectomy and opticociliary neurectomy. 2. Poor. Usually alternative enucleation. 3. In some cases. 4. Opticociliary neurectomy. 5.? 6. ?

MARPLE: 1. Iridectomy. 2. Not satisfactory. 3. Yes, in suitable cases. 4. Trephining. 5. None. 6. None.

THOMSON, E.: 1. Iridectomy, sclerotomy. 2. Poor (cases all advanced). 3. Yes. 4. Trephining. 5. None. 6. None.

HANSELL: Never operated for cure.

VEASEY: 1. Only iridectomy. 2. Very few cases. Progress checked in one, but eye enucleated. 3. Yes. 4. Lagrange or Fergus-Elliott operation. 5. None. 6. None.

RISLEY: 1. Broad peripheral iridectomy. 2. With two exceptions, without benefit. 3. Yes. 4. Iridectomy. 5. In one case. 6. One case.

REBER: 1. None. 2. With miotics, results poor, in four cases (six eyes). 3. Yes. 4. Elliott's operation happily adapted to this class of cases. 5. None. 6. None.

GIFFORD: 1. Iridectomy and De Wecker's sclerotomy thods Bad with iridectomy; good in one with posterior sclero[illegible] repeated a second time. 3. Yes. 4. Sclerotomy; trephining[illegible] None. 6. None.

made

KEY: 1. Lagrange with large iridectomy. 2. One case bilateral two years after operation T. + 20-30 mm. of mercury; one eye vision = 20/30, other light perception. 3. Positively. 4. Lagrange. 5. One. 6. ?

SWING: 1. Iridectomy. 2. One case cited eye operated did well, other eye not operated lost. 3. Yes, in progressive cases. 4. Filtering scar operation. 5.? 6. None.

CHATHAM: 1. Ablation of the cornea with subsequent iridectomy in bilateral cases. 2. Poor. 3. No. 5. ?. 6. None.

HOWE: Recalls one case in which he removed the lens, result, finger counting.

WOODRUFF, H. W.: 1. Iridectomy. 2. Bad. 3. No. 5. None. 6. None.

SATTLER: 1. Paracentesis of the anterior chamber. Iridectomy and anterior and posterior sclerotomy. 2. Unsatisfactory. 3. Only in certain cases. 4. Iridectomy. 5.? 6. ?

KOLLOCK: 1. Removed lens in one case. 2. Unsatisfactory. 3. In some cases. 4. Posterior sclerotomy repeated. 5. ? 6. Majority negroes and mulattoes.

HOLLOWAY: 1. None. 3. Attitude against operation. 5. None. 6. None.

BROWN, S. H.: 1. None. 2. None. 3. No. 4. None. 5. One hundred per cent. (in a recent case the Wassermann reaction was positive).

An analysis of the preceding replies shows that iridectomy gave fair results to 42 per cent., and poor results to 58 per cent. of the operators employing it. Sclerotomy gave fair results to 28 per cent. and poor results to 72 per cent. of the operators using it. Paracentesis of the anterior chamber with iridectomy gave unsatisfactory results to 100 per cent. of the operators using it. Sclerectomy gave satisfactory results to 40 per cent., encouraging to 20 per cent., and unsatisfactory to 40 per cent. of the operators employing it. Cyclodialysis gave unsatisfactory results to 100 per cent. of the operators using it. Miotic treatment was on the whole found to be unsatisfactory.

While the number of cases seen by the individual operator was small and the total for any particular operative procedure not large, a summary shows that the only method which gave satisfactory or encouraging results to the majority of surgeons employing it, was some form of sclerectomy.

Iridectomy and sclerotomy are the operations which have been longest employed, and it cannot be said that they have inspired confidence except when performed in the very earliest stage of the disease.

The dangers of iridectomy are patent. The sudden release of the intra-ocular tension in an eye in which the natural barrier between the vitreous and the wound has been weakened by disease, is always fraught with danger and often results disastrously. If the disease is to be arrested, the early age at which it is necessary to operate requires the use of a general anesthetic. Vomiting and the natural restlessness of the child after the use of a general anesthetic further increase the danger.

The objections to sclerotomy and to paracentesis of the cornea are that it must be often repeated and even then is often only preliminary to some other form of operation. Of the different ways of performing sclerectomy that of Fergus-Elliott is attended by the least hazard and is easiest of performance. It is inferior to the Lagrange operation in that the filtration area is not so extensive and the scar is not so well placed for permanent effect. The position in which the incision is made in the latter operation is, however, more dangerous. An operation which has been advised by several operators and performed by a few, and which seems to be well adapted to [illegible] conditions present in hydrophthalmos, is de that th[illegible]s. The deep anterior chamber present in these eyes renders the operation less difficult of performance than in primary glaucoma for which it was devised. That the progress of the disease is sometimes naturally arrested must be taken into consideration in weighing the evidence presented favorable to any operative procedure. Limitation of the progress of the process is not however constant enough, nor does it as a rule occur early enough to justify tentative treatment.

The history in brief of the case of hydrophthalmos with congenital coloboma of the iris from which the specimen for histologic study was obtained was as follows:

CASE 1.—E. B., colored, aged 3 years. Right eye large at birth and has increased but little. Left eye gradually growing larger for past three months. Right eye, broad congenital coloboma of the iris below extreme distention of the globe. Corneal diameter 18 mm. T. + 1 ? (Schiötz tonometer 33 mm. of mercury). Vertical width of palpebral fissure 31 mm. Apex of cornea 15 mm. in advance of its fellow. No view of fundus on account of the corneal haze. Right eye, broad coloboma of iris below. Globe not much enlarged. Diameter of cornea 9.5 mm. T. + ?. Vertical width of palpebral fissure 18 mm.

After enucleation left eye measured 37 mm. in its anteroposterior diameter.

Anatomic Study.—This was made by Dr. Nelson M. Brinkerhoff of the pathologic laboratory of Wills' Hospital, who has furnished the following report: "The globe measured in its anteroposterior diameter 35 mm. and in its longest transverse diameter 28 mm. The anterior chamber was very large; 5 mm. in depth and contained a watery fluid. The crystalline lens was cataractous and dislocated into the anterior chamber. The iris was atrophic and presented a congenital coloboma below measuring 12 by 5 mm. The ciliary body was markedly atrophic. The chorioid and retina were also atrophic to a less degree. The sclera was thinned and stretched throughout. The nerve was atrophic and deeply cupped. The vitreous chamber was filled with a brownish-yellow fluid.

"*Microscopic Examination.*—Cornea was thin. The layers were all present; there being some separation of the middle third of the substantia propria. The iris tissues were atrophied. The chromatophores were decreased and the pigment epithelium increased. Schlemm's canal was absent. The angle of the anterior chamber was completely obliterated by connective tissue which, with some endothelial elements structurally arranged, probably represented the pectinate ligament. The ciliary body was atrophic. The processes were stretched, elongated and superimposed. The retina was degenerated, atrophic and cystic. The epithelium however was increased. The nerve-fiber layer was thickened and the molecular layers in several positions had coalesced. The rods and cones were well developed. The chorioid was atrophic, there being excessive proliferation of the connective tissue throughout which almost obliterated it; it being represented for the most part by an opaque pigmented line. There was general thinning of the sclera. The nerve was deeply cupped, and formed mostly of connective tissue. Some of the cells were pigmented. The subdural space was obliterated and the subarachnoid partially so." The conditions present place the process in the first of Magitot's classes. The condition of the angle of the anterior chamber suggests the descriptions given of it by Collins.

Dr. E. V. L. Brown, who kindly looked over several of the specimens, finds an absence of Schlemm's canal, aplasia of the entire venous system of the angle and obliterating endophlebitis of the scleral emissaries from the canal area and of some of the anterior ciliary veins; and on the side of the coloboma also of some of the anterior ciliary arteries. There is incomplete separation of the iris from the cornea. There is no prenatal iris tissue, over the corneoscleral trabeculae. The spaces of the trabeculae are wide open and unobliterated, though the individual trabeculae are rich in endothelial nuclei. He believes that the absence of Schlemm's canals and venous system better explains the production of hydrophthalmecent this case than the incomplete separation or persine other of Schlemm, prenatal pectinate ligament (Collins), as in the sections studied by him the anterior chamber is not sufficiently cut off from the trabecula spaces to bring on hydrophthalmos.

CASE 2.—In the fall of 1910 I had referred to me, at St. Agnes Hospital, A. B., a white child, aged 3 years, with bilateral hydrophthalmos. The globes were very large and the tension moderately high. Vision was evidently much affected as there was nystagmus. The child, though well-nourished and healthy, was very fretful. Photophobia was extreme. Under ether anesthesia I attempted iridectomy, making the incision at the limbus. On completion of the section the lens and considerable of the vitreous extruded. The eye was lost from the resulting iridocyclitis. In the following spring, not having accommodations for the child I referred it to Dr. Posey at the Children's Hospital. Dr. Posey informs me that he first attempted cyclodialysis but failed. Subsequently he did a sclerotomy and later an iridectomy but the progress of the disease was unchecked.

I am indebted to Dr. C. A. Veasey of Spokane for the following case history and also for the eye which it was found necessary to remove. The anatomic study was made by Dr. Nelson M. Brinkerhoff who has kindly written the report of the findings:

"The patient, a boy, was first seen by me Oct. 7, 1908, at the age of 15 months. No family history of any unusual condition on either side could be elicited. At birth the right eye was found to be very much larger than the left and it had been gradually increasing in size up to the time of my examination, when the child was 15 months old. The tension was decidedly increased. The cornea was so hazy and the patient so young that it was impossible to ascertain the condition of the media by ophthalmoscopic examination. I do not know whether the lens was opaque or the optic nerve was cupped. On Oct. 12, 1908, I performed an iridectomy under ether anesthesia. Healing was uncomplicated, and the patient was seen several times between this date and June 19, 1911. During this period the increase in the diameters of the eyeball seemed to have been entirely checked. At this time, and for several weeks before, the parents stated that the child had displayed such great photophobia in the left eye that it was impossible to get him to stay out of doors in the bright light, and whenever he was exposed to the light he attempted to shield his eyes, although there was absolutely no macroscopic indication of any irritation whatever, externally or internally in either eye. This condition had continued for some time and had so alarmed the parents that on June 19, 1911, I enucleated the buphthalmic eye under ether anesthesia. The patient has been seen twice and apparently the photophobia of the left eye immediately cleared up and he has worn a glass without any difficulty. The left eye has been normal in all respects."

Anatomic Study.—"The globe measured in its sagittal diameter 32 mm., and in its vertical diameter 29 mm. The cornea was clear. There was a staphyloma of the sclera immediately behind the corneoscleral limbus. The anterior chamber measured 5 mm. in depth and contained no fluid. The lens was cataractous. The iris and ciliary body were thickened; the former presented an artificial coloboma. The vitreous chamber was filled with clotted blood. The retina was detached except at the ora serrata and nerve-head and was umbrella-shaped, occupying the anterior and central portions of the chamber. There was no apparent change in the chorioid and no appreciable cupping of the disk.

Microscopic Examination.—"The epithelial layers of the cornea were somewhat thickened. The superficial cell layers showed cloudy swelling. Descemet's membrane was normal, except for a single rupture, which may have been an artefact. On the posterior surface of the membrane there was a fine homogeneous deposit. The anterior chamber was obliterated, being filled with a similar exudate and with blood-cells. The iris was atrophic and the stroma elements were almost com- point y degenerated; at the pillars of the coloboma the pupil- has border was curled on itself anteriorly. The ciliary bodies affo atrophic and cystic. The remaining stroma was almost clinidy composed of pigmented connective-tissue cells. The race ciliary muscle was almost completely atrophic and elongated by traction. The pectinate ligament was obscured. *Schlemm's* canal was absent except at one point where it was represented by endothelial cells. The chorioid was atrophic and there was a proliferation of its connective tissue elements. The blood-vessels were obliterated. The vitreous chamber was filled with a fine granular exudate and free blood. The retina was degenerated. There were traces of its nuclear layer, and excessive pigmentation in the posterior zone. The sclera was thinned, the anterior portion more so than the posterior. The optic nerve was atrophic and the disk slightly cupped."

The study of these two eyes lends additional support to the view that the essential factor in the production of hydrophthalmos is an absence or incomplete development of the canal of Schlemm and that a probable contributing factor is the presence in the angle of the anterior chamber of prenatal connective tissue.

1819 Spruce Street.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. SATTLER, SCHOENBERG AND ZENTMAYER

DR. LEWIS H. TAYLOR, Wilkes-Barre: We are still far from the solution of the problem of glaucoma. Dr. Sattler raises the question as to whether increased tension be the first and actual dynamic factor in glaucoma. Whether it be or not, it is generally true that it presents itself as the chief factor in the cases when they are brought to us. At least this has been my experience and I think it has been yours. There are others but we do *not* usually have the chance to see them as the patients do not present themselves to us until the disease is well advanced. Dr. Sattler asks many questions which we would all gladly answer if we could. As I understand it, his view is that acute glaucoma and subacute or chronic forms are different processes and from different causes and this may open to us a new thought worthy of consideration. Modern viewpoints of glaucoma will include of course modern operations. Dr. Weeks, in a full discussion of this subject a few months ago before the Pennsylvania State Medical Society, described nineteen different operations with several modifications of some of them. I think we shall all agree that at present the operation that seems to meet with most favor is that of trephining the sclera. I have seen the operation of Elliott and some others performed, but thus far I have only performed the operation of iridectomy—the operation that Dr. Risley holds to be, if properly performed, the best of all—and so I am not prepared to speak from personal experience but only from observation of the newer method. I agree with the author that it matters little which operation is performed if the operator thereby can do a little good, stay the final extinction of function and at the same time avoid doing harm. With some ophthalmologists it is also a modern conception of glaucoma that all operations are of doubtful value, especially in hemorrhagic glaucoma, except that of enucleation. I agree with a writer of large experience as an operator who has recently said that it was a rule with him never to operate for glaucoma if the tension could be held at normal and loss of field and vision prevented by miotics.

DR. EMMET L. JONES, Cumberland: The experience I have had with glaucoma is not large but is in a direction entirely different from that in which everybody else has been looking. I have believed for a long time that glaucoma is not primarily a disease, but that it is a symptom of no man knows what, so far as I have been able to learn, and we may find a cure before we know what we are curing. I have had more experience in treating glaucoma complicating traumatic conditions than in primary glaucoma, but I have had some experience with acute, sudden, fulminant glaucoma, chronic glaucoma and in cases long totally blind and so intensely painful that [illegible] were usually removed. The plan of treatment has been thods conjunctival injections. I do not know what brings [illegible] the cure, but the results have been very satisfactory. Whe[illegible] it is due to circulatory or lymph stasis, whether it is dr[illegible] hardness, or whether the hardness is simply one of the symptoms I don't know. With the injections of cyanid I do not use dionin but have used epinephrin (adrenalin), and a single injection is usually all that is necessary. In Barrier's later book he speaks of using 1 to 1,000 iodate of soda. I have used that in some cases and the results are certainly marvelous in some instances. I do not know whether it removes the stasis or whether the continued pressure causes the emptying of the eyeball, but the lid swells up and the pressure continues for several days. One patient was a prominent attorney in the sixties who was seized with a fulminant attack of glaucoma in the night and did not know that he had lost his sight until the next day. Under profuse purging by salines, and miotics, eserin, etc., in twenty-four hours the violent pain had left but the eye was totally *blind. I gave* the injection. It is horribly painful, but *in thirty minutes* the pain had ceased and the patient went back to his office. He never had any pain afterward. In the course of two or three days vision was restored, the swelling remained some days, there was some transient diplopia, but the eye was absolutely restored without a vestige of after-effect. In some cases of these old totally blind glaucomas, I have seen the pain stop and the eyeball stay hard as wood. Likewise in chronic glaucoma it seems to be serving well, as far as I have been able to use it. It does better than other measures. The strength is from 1 to 1,500 of the cyanid and 1 to 1,000 of the iodate, using thirty drops. The solution soon decomposes into iodin and something else and must be made fresh.

DR. ADOLPH ALT, St. Louis: After Dr. Schoenberg's first paper had appeared in the March, 1913, number of Knapp's *Archives* I have repeatedly taken occasion to verify his statement that leaving the tonometer for a certain number of seconds on the cornea will reduce the intra-ocular pressure. Dr. Schoenberg attributes it to the influence which the weight of the tonometer exerts on the ocular drainage. This drainage, which in a normal eye, goes on continuously, takes place by means of preformed channels. The generally accepted opinion is that the drainage takes place solely into the venous circulation. I should not recall this to you, had not Leboucq in the *Bulletin de la Société Belge d'Ôphthalmologie* of April, 1913, published a series of experiments, by the results of which he considers it proven that the drainage of the anterior and posterior chambers takes place by means of the lymph-vessels accompanying the veins and is distinctly separated from the drainage of the posterior parts of the eyes. Thus, whether these findings prove to be correct or not, our seemingly well-established knowledge about the manner of ocular drainage is suddenly assailed again. That the ocular drainage must depend on the patency of these innominate channels seems indisputable. It naturally follows that anything interfering with this normal ocular drainage must lead to an increase in the intra-ocular pressure, and it is rather astonishing that Dr. Schoenberg found that an iritis in rabbits did not seem to influence the drainage. It seems to me that the experiments which led to this conclusion are the least conclusive in his series. Although his experiments regarding the action of the extrinsic muscles on the intra-ocular pressure cannot be called altogether *conclusive*, it seems impossible to conceive that the action of these muscles should not exert any influence on the intra-ocular pressure. Dr. Schoenberg's experiments referring to the relation of the drainage to the intra-ocular pressure, and especially to eyes which are suspected of a tendency to glaucoma, are of decided practical value. The fact which he has elicited that a reduced rate of drainage may mean a latent glaucoma, although the intra-ocular pressure may be below 26 mm. Hg, seems to be especially so. That the increase of the intra-ocular pressure in glaucoma is not disease and that even so-called primary glaucoma must be looked on as a symptom consequent on some as yet hidden affection, is, I do not doubt, the general opinion. [illegible]t, while treating symptoms is not the most scientific way tion[illegible]naging disease, it may be justified in glaucoma, until are[illegible] a [illegible]nown about it. It is as rational to interfere surgically that [illegible] to relieve the pressure and its dire consequences as are many similar measures in general surgery. Of course, when the primary cause is once known this must be taken care of, and yet, even then, it may still be, perhaps, a very rational procedure to establish quickly a reduction of the intra-ocular pressure.

DR. L. WEBSTER FOX, Philadelphia: Even in the large clinics of the East, where we see a great many cases, no ophthalmic surgeon has seen many cases of buphthalmos. I have seen probably five or six cases in my experience, and have found that it is a congenital defect, prenatal in its origin, in which usually at about the third month of intra-uterine life, there is a lack of development in the anterior part of the eye; the canal of Schlemm is absent and the result is an overdevelopment of the organ due to intra-ocular pressure and stretching of the tissues, whereby they are enlarged to an inordinate degree, producing buphthalmos, dropsy of the eyeball or the so-called "eye of Juno." I have tried various methods of treatment, including iridectomy and have felt that anterior and posterior sclerectomy have given me the best results temporarily, but they have ultimately failed and the eye has shrunken. I recently operated in a case according to the method employed by Dr. Spratt in the case he exhibited. I believe that this, which is the Elliott operation, is the one most suitable in this dread disease. My experience in the last two years with the Elliott operation for glaucoma leads me to this belief. Dr. Batroff and I, in a paper read before the Colorado Medical Society a few years ago, stated that in many of these cases of glaucoma an interstitial nephritis and an increase of blood-pressure was found. A few years ago, when Mr. Treacher Collins visited my clinic in this country, we had a case of acute glaucoma, with high blood-pressure, and also a high degree of intra-ocular tension. This patient had nearly 100 mm. pressure with the Schiötz tonometer. The eye was as hard as stone and vision was gone. This was a second attack; the patient had lost the other eye in an operation by a clever operator, who attempted an iridectomy and had what any surgeon might have had, a gush of vitreous with hemorrhage and destruction of the eyeball, necessitating enucleation. Taking this experience as a warning, I tried first of all to reduce the blood-pressure. The patient was bled, the sphygmomanometer applied, and the pressure was reduced from 275 to 150. Eserin was applied to the eye every half-hour for twenty-four hours, with no miotic effect until the blood-pressure was reduced, when we immediately obtained contraction of the pupil. After that I was able to perform an iridectomy with a satisfactory result. If the operation of Elliott does as much good in all cases of buphthalmos as in the little child we have seen here to-day, great advances will have been made in the treatment of the disease. I feel that LaGrange has accomplished the same thing in his operation as Elliott has with the trephine, but the man who has few operations cannot do it so well as one with a great deal of experience. I believe the Elliott operation is the one for the majority of operating surgeons.

DR. JOHN O. MCREYNOLDS, Dallas: I wish to add my endorsement to the method of trephining advocated by Colonel Elliott of Madras. Two years ago, at the Oxford Ophthalmological Congress, I had the pleasure of learning this method directly from Colonel Elliott, and my conviction as to its high value has grown stronger in the intervening time. Colonel Elliott's method of making the flap seems to have practically attained perfection. There may be, however, some room for study and discussion as to the best size and pattern of trephine to be employed, and the indications are that a large variety of such instruments will be employed by different men to accomplish the same result. But this is merely a matter of detail and only emphasizes the cardinal virtues of sclerectomy, a procedure which has been so thoroughly developed by our colleague of Madras I have been very much pleased with a substitute for trephining itself, by the employment of a small scleral knife and a small scleral stitch in the following way: 1. Prepare the flap essentially according to Elliott. 2. Take a fine, sharp full-curved needle carrying black silk t[illegible]ecent 3. Introduce this needle into and through the scle[illegible]ne other from the cornea, carrying the point forward t[illegible] of Schlemm, chamber from the angle of which the needle should now immediately emerge through the periphery of the cornea. 4. This will enable you to grasp securely 2 mm. of sclera in the loop of the thread which can now be held gently taut with the left hand. 5. Take a small scleral knife (a Beers knife will do) and by gentle strokes mark out a semicircular incision just enclosing on the outer side the small portion of the sclera in the grasp of the thread. 6. As the incision passes through the thickness of the sclera, the flap thus formed will be drawn by the thread towards the cornea, and the scleral flap may be thus extended by the knife until the anterior chamber is opened by its periphery, when the sclerocorneal flap may be excised as far forward as desired, taking care not to button-hole the reflected conjunctiva. 7. A portion of the iris should be excised leaving, however, the sphincter of the iris untouched, thus producing a button-hole in the iris which is quite sufficient and can be seen through the transparent conjunctiva when replaced. 8. The preservation of the sphincter means diminished trauma, better protection for the lens, increased efficiency of miotics, if subsequently employed, and a better looking eye. I have employed these procedures in both chronic and acute glaucoma with the most gratifying results.

DR. ALLEN GREENWOOD, Boston: I cannot help but feel that acute and chronic glaucoma are practically manifestations of one and the same disease. I think that every one of you has had the experience of a simple chronic glaucoma changing to the acute form under some circumstances of mental strain. I believe the trephine operation is one that has come to stay, but having commenced five years ago with the LaGrange operation I have continued it. During the five years, I have operated on twenty-five patients. Three years ago at the request of some of the gentlemen from St. Louis I operated on a patient before this Section at the hospital there, and I have just been informed that the patient still retains the vision restored after the operation. In the twenty-five LaGrange operations of five years' or less standing, some perhaps within two or three months, I have seen one eye lost. The majority of my patients on whom I performed the LaGrange operation have to-day a better field of vision than they had before the operation was performed. It seems to me that this is one of the crucial tests of the advantage of a LaGrange or a trephining operation. It is performed to obtain a filtering cicatrix and most of these patients to-day show a sort of boggy condition of the conjunctiva just above the limbus. It looks honeycombed, and we know that these patients are seeing and using their eyes in almost a normal manner. With regard to the use of miotics: in any case of chronic glaucoma where the field of vision and the vision itself can be retained as it is, and the patient has previously lost one eye, I very seldom operate, but where the vision is going down, as in the case of the patient in St. Louis, who had lost sight in one eye, I perform a LaGrange operation.

DR. WALTER R. PARKER, Detroit: I have always been interested in the fact that glaucoma may possibly be due to an obstruction of anterior or posterior filtration channels as mentioned by Dr. Alt. We have all seen cases of glaucoma in which our irridectomies have entirely failed. It seems to me there is a possibility of glaucoma being a posterior filtration disturbance, which is manifested by a shallow anterior chamber which would not be helped in any way by an irridectomy. On the other hand, a glaucoma that is dependent on obstruction of the anterior filtration channels would have some chamber left, in fact, it might be nearly normal; in these cases, I find iridectomy does better. In determining whether an iridectomy will benefit or not, the depth of the anterior chamber is important. The deeper the chamber the better are the chances of benefit from an operation. I have had experience with the Elliott operation in twenty-three cases. All but three had the tension permanently diminished. In each of th[illegible] three failures there were some inflammatory symptoms [illegible]nt. While the Elliott operation is becoming the operation of choice I think it should be limited to the non-inflam[illegible]ry cases. In two cases of buphthalmos, I have performed [illegible]uble iridectomy. In one no effect was noted, but in the

has [illegible] affo[illegible] clini[illegible] race second the tension was reduced from 70 and 74 to 30 and 34, respectively. Whether there will be a permanent benefit I am unable to say. In both of these cases the Wassermann was negative.

DR. S. D. RISLEY, Philadelphia: I should like to have Dr. Sattler tell us in his closing discussion whether there is any clinical method by which the probability of the claims of Fischer as to the existing acidosis of the tissues may be demonstrated.

DR. LUCIEN HOWE, Buffalo: For those who are interested in the subject it may be worth while to mention that these cases of buphthalmos and anophthalmos are treated with wonderful clearness and exactness in Eversbusch's "Augenerkrankungen im Kindesalter." A translation into English of this recent work is now being made.

DR. G. C. SAVAGE, Nashville: If it is true that Dr. Fischer is receding from his original teaching I regret it very much. I want to use this fact as an illustration of receding from a truth: Brown-Séquard, as everybody knows, was a strong advocate of the crossing of the nerve fibers from one side to the other. I heard him try to destroy that theory, yet it was a truth that he was trying to destroy. What we have heard here is a demonstration that here is a condition of the tissues of the eye which predisposes to glaucoma. Let us fight our way into the daylight concerning glaucoma, and let me beg of you, Dr. Sattler, to call Fischer back to his original teaching, even if he should find that a condition of the blood causes the acidosis of the tissues of the eye. I have never injected sodium iodate, but often have injected sodium citrate. I turn trembling from that to operative procedure, sometimes the trephine and sometimes iridectomy. In almost every case in which I have turned I have regretted it. But if in addition to the injections we can put something into the circulation that will help to cure the cases, let us do it. I am now treating a case of hemorrhagic glaucoma, and I venture to say that Dr. Risley would not operate in such a case for any consideration whatsoever. I treated the patient with eserin until she was losing her vision, and gave the poor woman, who was dependent on her daily labor for her subsistence, injections of sodium citrate in each eye once a week. Vision is almost normal in one eye and rapidly gaining in the other and she is at work every day, even on the days of the injection. Dr. Alt, I thank you from the bottom of my heart for the suggestion of the internal administration of calcium chlorid. The local condition of the eye leading to glaucoma may be superinduced by a state of the blood, which calcium chlorid may destroy.

DR. JESSE S. WYLER, Cincinnati: I should like to make a few remarks on Dr. Fischer's theory. Dr. Reubens of Heidelberg had studied Fischer's theory carefully and determined to work out three questions. The first was, what part of the enucleated eye takes part in the colloid swelling. We all know that the enucleated eye does swell. He found by producing this swelling in the eyes of rabbits and human eyes and then examining them, that the cornea and the sclera alone partook in the edema. This question then arose: How is the tension raised when the cornea and sclera alone are edematous? He found that the size of the ball did not increase externally but that the swelling took place inwardly, so that the sclera was increased in thickness internally and thus the area of the interior of the eyeball was decreased; the exterior remaining the same, and the contents remaining the same, the tension was raised. The third question was, Does this theory work out in living eyes the same as in enucleated eyes? He took a series of rabbits and injected subconjunctivally from 1 to a 10 per cent. solution of hydrochloric acid, which produced a great increase in tension, in some as high as 170 mm. He then reduced this tension by giving subconjunctival injections of sodium citrate, 5 per cent. Then, proving to his satisfaction that this worked in the laboratory, he determined to try it on human beings. But as so often happens, laboratory and clinical methods do not agree, and Reubens found every time he usedge sodium citrate with the tonometer readings that thtrinsion was not reduced. I personally tried citrate of made eight glaucoma cases, three acute, three of the chronic and two of the simplex variety. In none was the tension decreased; in fact, it was raised 5 or 10 mm. after the injection. In regard to the influence of blood-pressure, Kraemer von Graefe's *Archiv* published the results of work done in Fuchs' clinic. He selected at random fifty cases of senile cataract and took the blood-pressure with the Riva-Rocci instrument; then he took fifty glaucoma cases and found the average pressure about the same in both conditions. He could not find the slightest basis for the theory that increased blood-pressure had anything to do with the causation of glaucoma.

DR. OSCAR WILKINSON, Washington, D. C.: I think high blood-pressure has a great deal to do with the treatment of this disease. In my cases of chronic glaucoma I invariably try to reduce the blood-pressure and I believe that eserin and miotics have the better effect. I get better vision and an increased field of vision. I first give small doses of calomel and the hyposulphite of soda. Another remedy which I give in this class of cases is 2 or 3 grains of mercuric chlorid in saturated solution of potassium iodid, which gives the biniodid of mercury. The mercury is an antiseptic and the iodid gives an alterative effect. Diet plays an important part in the handling of these cases. I take them off of meats, except chicken or game and fish. Even the buttermilk diet is good. When the diet is controlled and an alterative has been given, the chronic cases of glaucoma are in a measure under control, and I think this has a direct influence on the case—as much as eserin itself. The trephine operation is the ideal one for the ordinary practitioner. I have had experience in several cases, and in one of these in particular, in which there was high tension due to an attenuated cornea, the tension was reduced to normal and the size of the eye was materially reduced.

DR. W. H. WILDER, Chicago: The results of Dr. Schoenberg with the tonometer confirm the belief that in glaucoma we are dealing with a condition in which there is some obstruction of those channels which allow the escape of fluids from the eye rather than in the vessels that admit blood to it. It seems to me that we have a clue to the subject in the condition of hydrophthalmos which we know to be due, in some cases at least, to the obliteration or lack of development of the spaces of Fontana or the canal of Schlemm. It cannot be that everyone is liable to glaucoma, for after all it is comparatively infrequent, and we must realize that only certain individuals are susceptible to it, and these for some reason, may have some peculiar condition of the tissues of the eye, or of the vessels concerned with the outflow of fluids from the eye, that render them liable, with a suitable exciting cause, to an attack of glaucoma. Persons who do not possess this peculiar type of vessels will not develop glaucoma, even if subjected to the causes that would precipitate an attack in those so predisposed. Hence, work like this of Dr. Schoenberg's may enable us to determine by means of the tonometer the degree of patency of the channels of outflow of the eye. All our operative procedures are merely remedial and do not reach the base of the trouble. I was hopeful that the studies of Fischer on this subject would give us something of a working hypothesis, but in the Illinois Eye and Ear Infirmary, where we tried the injections of sodium citrate in the acute, chronic and simple forms of glaucoma, we could not see that the patients derived any material benefit.

DR. EDWARD JACKSON, Denver: We appreciate especially Dr. Schoenberg's observation that retarded drainage may be of real diagnostic value. I think we shall soon come to realize that the absolute height of the intra-ocular tension does not furnish a satisfactory basis to decide the presence or absence of glaucoma. Priestly Smith's definition that glaucoma is increased intra-ocular tension plus its causes and effects, is the best definition. But there is a clinical entity which is something more than increased tension; and increased hardness of the eyeball can exist outside of that clinical condition that we characterize as glaucoma. I have under observaarien a patient whom I have had the opportunity of watching that thut seven years, in whom one eye is entirely blind and both eyes present typical glaucoma cups. Only once in that time have I been convinced that the tension was above normal, and since I have used Gradle's modification of Schiötz's tonometer I have never found it above normal; but there is not the slightest question that the man has glaucoma. On the other hand, within the last year I have observed three cases, in young women, in whom the intra-ocular tension rose to about 50 mm.—one to about 60 mm.—with the clinical symptoms of an acute, mild attack of glaucoma, some redness, very distinct pain and marked dilatation of the pupil. In two cases, this followed needling for congenital cataract. The other was a case of tuberculous chorioiditis at the macula. All of these eyes have gone back to normal condition without any radical treatment for glaucoma, although when I first found that the tonometer was registering something like 60 mm. of mercury I was afraid they were starting on a course of glaucoma. The height of the intra-ocular tension at the time of one observation is not an indication that can be wholly relied on to decide as to the presence of the disease that we know as glaucoma. Therefore the symptom of diminished intra-ocular drainage may be one of even greater significance.

Dr. Charles N. Spratt, Minneapolis: The little girl with the buphthalmos who was exhibited here this morning is 6 years old; the father and mother are second cousins. At the age of 3 or 4 months it was noted that there was something wrong with the eyes, which were sensitive to light. Only within the last two years an increase in the size of the globe has been particularly noted and photophobia has been marked. We took the tension of the left (blind) eye of the patient, the tension being plus 1. Trephining was performed, and was followed by a gush of yellowish aqueous that came out of the top of the trephine. The patient moved during the anesthetic and lost some of the vitreous. She struggled considerably after the operation and the dressings were stained with blood that evening; there was considerable hemorrhage. In the right eye the vision was equal to reading large newspaper print at 4 or 5 inches. We did a paracentesis to reduce the tension. It remained down and forty-eight hours afterward trephining was performed on that eye. The tension has been much less than before the operation; the patient has had less pain, sleeps better, is better-natured and the eyes have not been as red. Regarding vision, it is difficult to say as she still has considerable photophobia. If something is not done in these cases they will result in total blindness. Iridectomy, as has been said, is not a safe procedure, and trephining, with a preliminary paracentesis, is the only legitimate thing to be done. I had a similar experience with an old lady with glaucoma absolute on whom an iridectomy had been performed eighteen years ago. I did a trephining and a severe hemorrhage followed. The eye was lost with iridocyclitis. Reducing the blood-pressure by blood-letting and thus reducing the tension of the eye may be all right, but it seems to be a little in the way of the Chinese method of making a roast pig by burning the house down.

Dr. Robert Sattler, Cincinnati: The discussion has brought out varied opinions concerning the nature and treatment of glaucoma in general. I will only add a few words and repeat the main purpose of the paper; that modern opinions of the pertinent facts of glaucoma restrict its scientific interpretation. Formerly every hypertonic globe was so designated. Our present understanding of the origin and pathology of primary glaucoma should confine the name to its two distinctive clinical phases—chronic non-inflammatory and acute or subacute inflammatory glaucoma. Dr. Savage has referred to the Fischer treatment. My reason for not taking this up more fully at present is that this subject was discussed in a special paper read before the Cincinnati Research Society, May, 1913. Now as formerly, we give Fischer's treatment a trial in selected cases, but have given up the local or subconjunctival injections of citrate of soda solutions. We adhere faithfully to Professor Fischer's suggestions concerning the internal administration of alkaline remedies and the use of slow rectal injections of citrate of soda in certain cases.

Dr. Mark J. Schoenberg, New York: I expected more criticism. Dr. Alt said that my experiments on the reflex action or relation between distant organs and the intra-ocular pressure were not conclusive. Many of my experiments are not conclusive. I came here with only a very incomplete record of certain series of experiments. I only tried to stimulate work along the same line. Dr. Alt says we cannot give up local treatment. I did not say anything about giving it up. I said it is not rational, and it is not. It is like stripping the kidney of its capsule in some forms of nephritis. Nephritis cannot be cured in that way; neither can we cure glaucoma by any kind of an operation on the eyeball. The present tendency to devise operations for the relief of tension is not rational. The essence of glaucoma is not increase in tension, just as high blood-pressure is not of arteriosclerosis.

Dr. William Zentmayer, Philadelphia: The cumulative evidence we now have that infantile glaucoma is due to the faulty development of Schlemm's canal will be of assistance in pointing out the pathogeny of glaucoma. Of course it is well recognized that the disease described in my paper is true glaucoma. The only reason the symptoms are different is the difference in the tissues of the immature and the mature eye. I want to caution against operation in advanced cases of this affection. One of the reasons for writing the paper was the disastrous result in such a case. I tried to do an iridectomy and lost the eye at the time of the operation. The vitreous lens extruded through the wound. The child returned to the city later and I was compelled to turn the case over to a colleague, who tried to do a cyclodialysis and failed. Subsequent operative procedures likewise failed. In regard to Dr. Spratt's remarks I would like to say that the prognosis is not so grave for unoperated eyes as he states. A great many cases are on record in which the process was naturally arrested. This is explained by Treacher Collins on the ground that the trouble is a persistence of the fetal ligamentum pectinatum in the angle of the anterior chamber, and these attachments are broken loose as the eyes grow and a natural cure is effected. The LaGrange operation I believe is in many respects superior to the trephine. The cicatrix is larger, is better placed, so as to open the suprachorioidal space better, but is not so simple as the trephine operation and should not be attempted in this type of glaucoma.

TRACHOMA, ITS PREVALENCE AND CONTROL AMONG IMMIGRANTS

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For the purpose of this paper, trachoma, or granular lids, may be defined as a communicable disease of the conjunctiva of unknown etiology, chronic in character, and prone to remissions and exacerbations. It is characterized by granules or the so-called trachoma bodies, with more or less hypertrophy, is most resistant to treatment and is always followed by the stage of cicatrization. By reason of its communicability, chronicity of course and often disastrous results, trachoma is the most important of all the inflammatory diseases of the conjunctiva.

The dissemination of trachoma has often been charged to Napoleon's soldiers when they returned to Europe from Egypt, where they suffered extensively with a distressing ophthalmia. It is undoubtedly of far more ancient origin, however. It is supposed to have been originally endemic in the Orient, whence it extended gradually to the westward. Trachoma has usually been considered as an exotic disease, but recent investigations have shown that our Indians are heavily infected and that the inhabitants of at least parts of the Appa-[illegible] range of mountains suffer from this disease to [illegible]rming extent. Further investigations will more than likely show a surprising amount of this disease. The disease prevails in Turkey, Russia, Southern Italy, Austria-Hungary and Greece. It has been generally believed that the negro is immune to trachoma, but numbers of well-marked cases are annually detected from the West Indies. One of the most marked and stubborn cases that has been treated at Ellis Island was in a negro girl. Ninety per cent. of the population of Egypt are said to be afflicted with trachoma. The wide-spread prevalence of this disease there renders it necessary for the British government to maintain a system of ophthalmic hospitals for the relief of these unfortunate people. The medical examination of all arriving aliens is imposed by law on the medical officers of the United States Public Health Service. Section 2 of the immigration law as amended in 1910 provides for the exclusion from admission to the United States of the following classes of aliens:

> Idiots, imbeciles, feeble-minded persons, epileptics, insane persons, all persons who have been insane within five years, persons who have had two or more attacks of insanity at any time previously; paupers, persons likely to become public charges, professional beggars; persons afflicted with tuberculosis or with a loathsome or dangerous contagious disease; persons not comprehended within any of the foregoing excluded classes who are found to be and are certified by the examining surgeon as mentally or physically defective, such mental or physical defect being of a nature which may affect the ability of such alien to earn a living.

The "Book of Instructions for the Medical Inspection of Aliens," revised Jan. 18, 1910, classifies trachoma as a "dangerous contagious disease," which puts it under the provision of the immigration law and makes mandatory its deportation.

Section 9 of the immigration law provides that a fine of one hundred dollars be imposed on the steamship company for every "dangerous contagious disease" brought to the United States which might have been detected by means of a competent medical examination at the time of foreign embarkation.

Many prominent ophthalmologists of this country had insisted that trachoma was a communicable disease which caused disastrous results to the eye and should, therefore, not be permitted to enter this country. Trachoma was classified as a dangerous contagious disease in 1897 and the credit is due to some of the leading ophthalmologists of this country. Prior to this time it was not so classified and undoubtedly many aliens were landed here suffering with this disease, thus establishing foci of infection.

Trachoma thus became an excludable disease and, since 1897, thousands of persons with it have been excluded from landing. Fewer cases of trachoma are now found among immigrants and only a very few of the old and worst cases, "Egyptian ophthalmia," with its distressing complications, as compared to the numbers formerly encountered. This must be attributed to the fact that the steamship companies maintain an inspection service abroad in an effort to prevent the embarkation of persons of this class, which would mean deportation and possibly fines, especially the latter. A few hundred dollars in fines have a more deterrent effect than many dozen deportations. It has been stated that the steamship companies are rejecting in Europe on account of trachoma thousands of applicants for passage each year. This means that there is an accumulation of these persons ready to take immediate advantage at any time the laws and regulations might be less stringent in this respect. The careful examination made of all eyes on arrival not only prevents trachoma from being brought here, but deters those suffering from this disease from embarking. In spite of this, there were twenty-five hundred aliens found to be suffering from trachoma and so certified during the fiscal year ended June 30, 1911.

Immigration to our shores during the past ten years has been nearly one million annually. In 1907 it reached its highest point, when 1,300,000 were admitted. During the past fiscal year about 70 per cent. of the total immigration came from Eastern and Southern Europe and Western Asia. Nearly 40 per cent. of the total for that year came from two countries, viz.: Russia and Italy, the former mostly from Southern Russia and the latter from Southern Italy. About 11 per cent. came from the various provinces of Austria-Hungary, 3 per cent. from Greece and 2 per cent. from Turkey (Europe and Asia).

At the port of New York (Ellis Island), which is the gateway for about 75 per cent. of our immigration, 750,000 aliens were examined during the fiscal year ended June 30, 1911, and 1,167 of them were found to be suffering from trachoma. The past fiscal year 718 cases of trachoma were detected among 725,000 arriving aliens. During the six years from 1907-1912 there were 6,657 cases of trachoma certified at Ellis Island—an average of 1,100 cases annually. Of the 1,167 cases certified at Ellis Island in the year 1911, nearly 60 per cent. came from Russia and Italy (South), both countries furnishing about the same amount; about 16 per cent. from Austria-Hungary, about 13 per cent. from Turkey and the remainder from Greece and various other countries. Of the 718 cases certified at Ellis Island during the last fiscal year, Russia furnished 35 per cent.; Austria-Hungary, 22 per cent.; Italy, 14 per cent.; Turkey, 17 per cent., and Greece less than 5 per cent. It will thus be seen that the majority of trachoma among immigrants comes from Russia, Italy, Austria-Hungary, Turkey (Armenia, Syria, etc.) and Greece. Fortunately we get but little immigration from Egypt, where the disease is so distressingly prevalent.

Statistics show that this disease is found most extensively among the following races: Syrian, Armenian, Italian (South), Hebrew, Polish, Greek, Lithuanian and Slovak.

While the national government does not attempt to pass on the mental and physical condition of the immigrant until he arrives at one of the ports of entry of the United States, the steamship companies have instituted a system of medical examinations of all emigrants prior to embarkation. I am informed by a representative of one of the steamship companies that the following method of examinations is now practiced abroad: The steamship companies have established near the German border what they term "control stations," or detention houses for emigrants originating in Eastern Europe, Russia, Austria-Hungary, etc. Emigrants are held at these detention houses or "control stations" until a sufficient number have accumulated, when they are forwarded to Bremen, or wherever it is the intention to embark them. There are about ten of these "control stations." Before the emigrants are permitted to leave the "control station" they are examined as to their physical and mental condition by a physician who is employed especially for this purpose, and those passed proceed to the port of embarkation. Those in whom some diseased condition of the eye is found of sufficient importance are held at the control station for treatment, if it appears that the condition might be easily curable. If a case is recognized as trachoma, however, and prolonged treatment required, the patient is sent home and advised to try again after having his eyes treated and cured. On arrival at the port of embarkation they are put in the company's detention house and are examined again prior to embarkation by the ship surgeon and a local physician in the employ of the company, with a view to another weeding-out process. During the voyage the doctor is supposed to make a daily examination and isolate such eyes as might convey contagion.

Trachoma without secretion is probably but slightly infectious, but the onset of an acute ophthalmia would at once render the case highly communicable. The relapse on board ship of an old trachoma, previously quiescent, sometimes infects other passengers. There are recorded instances which prove this. The average case of trachoma found on arrival here, however, will usually show evidences of long standing if a very careful examination is made of the entire conjunctival surface after subsidence of the more acute symptoms. The raspberry-like appearance assumed by the conjunctiva during a relapse is quite analogous to acute granulations, and only after subsidence of the more acute symptoms can an estimate be made of the length of time the disease has existed. It is this proneness to exacerbations and remissions that makes it such a difficult matter to decide when a case of trachoma has really recovered. When the disease has reached that stage of cicatrization in which the conjunctiva presents that smooth, glistening appearance we are agreed it is cured. This cure, however, is often attained after the patient has suffered from the disease for a long time, only to remain a burden to himself and friends as the result of the various sequelae. Experience has shown that, in order to ascertain definitely whether or not trachoma is present, it is necessary to bring clearly into view the retrotarsal fold by doubly everting the upper lid. This is best accomplished by the use of a small instrument.

Since about three-fourths of arriving aliens are medically examined at Ellis Island, a brief description of the method of detecting and certifying trachoma there will be given. The immigrants pass in line, several feet apart, before the medical examiners. One doctor looks especially for mental conditions, another for general diseases and defects, while the last doctor examines with special reference to disease of the eyes. Both eyelids are everted with the assistance of some small blunt-pointed instrument, in such a manner that the retrotarsal folds are clearly seen. Those with any abnormal conditions are put aside for further examination and diagnosis. In the rooms reserved for this purpose the alien is carefully examined. If the eye has trachoma, or is thought to be suspicious, the alien is sent to the Immigrant Hospital for treatment and diagnosis. Apparently trachoma commences as an acute conjunctivitis, and while this inflammatory condition may vary somewhat from the average acute conjunctivitis, it requires observation and treatment varying from several days to several weeks before a positive diagnosis can be made. This rule is followed in the medical examination of aliens, and it is found that the ordinary catarrhal conjunctivitis will subside in a comparatively short time, while the trachomatous case will soon show the hypertrophy and present the raspberry-like appearance so characteristic of acute trachoma.

The diagnosis and prognosis of trachoma is the most troublesome subject with which the medical examiner of aliens has to deal. The diagnosis of a well-marked case presents no special difficulty to one at all familiar with the disease, but the borderland cases, those of long standing and quiescent at the time of examination, or too acutely inflamed to classify, are the difficult cases to decide. While the disease is communicable from the beginning, just at what stage of the process of cicatrization the line is to be drawn between contagious and noncontagious, is one of the difficult problems in connection with the certification of trachoma under the immigration law. If we agree that the disease is not communicable when there is no secretion present, who can say when this quiet stage will give way to a condition analogous to acute granulations under the stimulus of some foreign substance and be communicable? It must be remembered that when the diagnosis of trachoma is made in the case of an alien and he is so certified to the immigration authorities, he is also certified as having a "dangerous contagious disease," which puts him within the provisions of the law, thus making his deportation mandatory. This is a serious matter with the alien, who has probably sold all of his worldly goods to secure enough money to come to America. It is therefore of the highest importance that there be no mistake in the diagnosis. A mistake made in the diagnosis of this disease by the general practitioner works no special hardship on the patient, but sometimes enables him to make a quick cure in his case of trachoma (?).

Trachoma is essentially a chronic disease, the time from the stage of invasion to the terminal one of cicatrization is often one of years, and quick cures are usually mistaken diagnoses. Observation and treatment are necessary in acute cases and relapses. Simple remedies will cure the acute catarrhal conjunctivitis in a reasonable time, but will not affect the trachoma. Follicular conjunctivitis resembles the granular form of the disease. The follicles, however, are arranged in rows not unlike small beads, and their distribution corresponds with the normal follicles of the conjunctiva. They cause comparatively little trouble and recover without damage to the conjunctiva. The pavement-like epithelium of vernal catarrh, covered with a milky film and characterized by excessive itching, burning and watering of the eyes, and coming on with the first warm days of spring, will usually clear up the diagnosis.

Parinaud's conjunctivitis, rather a rare disease, said to simulate a severe trachoma, is ordinarily unilateral, affects the neighboring lymph-nodes and has marked constitutional symptoms.

There is plenty of evidence to prove that trachoma is a communicable disease; the condition of the eyes, varying from defective vision to total blindness, often seen as a result of this disease, shows that it must be considered dangerous, not directly to life, but certainly to the sense of sight, by reason of the destructive effect on the tissues of the eye. Surely any disease which will destroy the sense of sight must be considered a dangerous disease.

The number of persons in foreign countries who are not permitted to embark for this country because they have trachoma must be constantly increasing. Their relatives and friends are arriving here in a constant stream and are, of course, much interested in gaining the admission of those who are now prevented from emigrating here. Every effort is made to enlist the public sympathy with this end in view, and the daily papers very often contain minute descriptions of the many hardships of deportations. The diseased members of a family are often left behind, while those able to pass our examinations come to this country and establish a residence. When the diseased alien arrives it is then pointed out that to deport him would be a great hardship to separate families, as all of the family are in this country. Deportation is unquestionably a hardship, and so is isolation in small-pox, but who would say that the latter should mingle with others because of the dread of the pest-house? One had better have small-pox than severe trachoma. At various times there have been discussions as to whether there should be some modification in the government's classification of this disease. Before any such change is determined on, however, it is well to consider that any such modification would mean the addition to our population of these thousands of trachomatous aliens whose emigration to this country is now prohibited.

It is a fact that trachoma is more easily preventable than curable, and is a splendid example of the old adage, "an ounce of prevention is worth a pound of cure." Our immigration law is the only guard we have against a disease that causes visual damage in 75 per cent. of untreated cases. Aside from the individual hardships and the ever-present handicap of the victims of this disease, there is an economic side that must be considered. The desperate conditions that may result from trachoma will impose financial burdens on the community and blindness may render its victims public charges. Every deportation probably entails some hardship, but deportations will occur as long as we have an immigration law. The sad cases are unfortunately not a few, but this is inevitable, and we should not allow this to work on our sympathy to such an extent that we are blinded to our duty to our own people. The fact that trachoma is already present is no argument in favor of importing more. The plea is often made by relatives and friends that these unfortunate people be sent to local hospitals for treatment at their own expense, and the law has provision for certain cases to be so treated. They are, however, usually not satisfied to remain there until a cure has been effected, and the doctor is continually importuned to release them. In fact, it is difficult to say when a disease is actually eradicated which is so prone to relapse as is trachoma. Although trachoma is very resistant to treatment, it is curable, and those aliens suffering from it should look to their treatment and cure before presenting themselves for admission to this country. There are plenty of immigrants seeking entry to our country who are free from disease, and there is no reason why we should accept those suffering from trachoma, a dangerous communicable disease. While trachoma is excluded as a "dangerous contagious disease" by the general government, there has so far been apparently little notice taken of it by the various states. Although many observers have sought for the cause of trachoma, its etiology is still in doubt, and we are unfortunately compelled to rely on clinical manifestations for diagnosis. Trachoma is a public health problem of the highest importance, and too much consideration cannot be given to its control.

TRACHOMA AMONG THE INDIANS

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The destructive effects of trachoma on the eyesight and the difficulty and tediousness of effecting a cure are so well known that the apparent rarity of the disease in continental America has, until recently, been a cause for congratulation.

It is true that, prior to 1897, cases of trachoma in recently landed immigrants were common enough in the eye clinics of our large cities. Since the time, however, when trachoma was classed by the federal authorities as a dangerous contagious disease, the exclusion of aliens so afflicted has been made mandatory by law and every arriving alien is examined to determine the presence or the absence of the disease in question.

As trachoma does not originate, *de novo,* in any uninfected territory, and its presence in any locality can be ascribed to previous importation, the action of the government in excluding persons afflicted with a communicable disease so likely to result in reduced social and economic efficiency has been a public-health measure of the first order. This measure has given our citizens the assurance that the members of those afflicted with this destructive disease will not, at present, receive many additions from other lands.

Recent investigations have shown, however, that there exist in the United States a number of important endemic foci of trachoma, among them the Indians, and it is the purpose of this paper to deal with the prevalence of this disease in that race. The facts herewith presented are based on the results of an investigation made last autumn by the Public Health Service as to the prevalence of tuberculosis, trachoma, small-pox and other infectious and contagious diseases among the various Indian tribes of the United States. The investigation was ordered by Congress and a report of the findings was rendered to that body Jan. 25, 1913, and published as Senate Document 1038.

The investigation was conducted under the immediate supervision of Assistant Surgeon-General J. W. Kerr, and I was one of the fourteen officers of the Public Health Service who took part in the inquiry.

As a result of the investigation, it may be stated at once that trachoma was found to be a veritable scourge among the Indians, as will be amply shown by the figures herewith presented.

It should be mentioned that the Indian Service had already called the attention of Congress and the medical world to the prevalence of this disease among Indians, and the investigation made by the Public Health Service was the direct outcome of such reports.

SCOPE OF THE INVESTIGATION

The Indian population of the United States is widely dispersed, individuals of this race being located in practically every state, and Indian reservations being situated in at least twenty-five states. According to official figures of the Indian Office, the Indian population in the continental United States is 322,715.

Of this number 39,231, or approximately one-eighth, were examined by the officers engaged in the investigation. Considerable difficulty was encountered in making these examinations because of the season in which the investigation was begun (fall of 1912), the short time available (a full report of the investigation had to be rendered to Congress before Feb. 1, 1913), the wide areas over which Indians are scattered on reservations and the inaccessibility of places where Indians are located. Long distances were traveled by the several investigators on foot, on horseback, by teams, motor-cars and motor-boats.

Besides the physical difficulties just mentioned, the natural diffidence or distrust of the Indians had to be overcome. Many Indians object to furnishing information about themselves and are loath to permit physical examination, either because they are ashamed of bodily defects or diseases or fear to subject themselves to malign influences.

RESULTS OF THE INVESTIGATION

Out of the 39,231 Indians examined, 8,940 individuals, or 22.7 per cent. of the entire number examined, were found to have trachoma. If this rate of infection were found to prevail for the entire Indian population of the United States, there are, at the present time, some 72,000 cases of this disease among this class of the population.

The persons examined represented both sexes and all ages, and included students in Indian boarding-schools, in day-schools and mission schools, and reservation Indians.

The accompanying table shows the number of Indians examined in each state, the number of cases of trachoma found, and the percentage of incidence.

TABLE SHOWING PREVALENCE OF TRACHOMA AMONG INDIANS IN DIFFERENT PARTS OF COUNTRY

State	Indians Examined No.	Cases of Trachoma	Per Cent.
Arizona	5,873	1,459	24.9
California	1,555	238	15.3
Colorado	292	41	15.64
Florida	22	....	....
Idaho	526	84	15.96
Iowa	53	17	32.04
Kansas	834	176	21 1
Michigan	643	48	7.46
Minnesota	3,542	533	15.05
Montana	2,042	537	26.3
Nebraska	322	130	41
Nevada	851	229	26.9
New Mexico	2,207	494	22.38
New York	943	2	0.2
North Carolina	317	23	7
North Dakota	3,447	791	22.94
Oklahoma	3,252	2,235	68 72
Oregon	904	94	10.4
Pennsylvania	552	76	13.76
South Dakota	6,121	1,059	17.24
Utah	182	75	39
Virginia	43	13	30.2
Washington	1,347	180	13.85
Wisconsin	2,999	207	6.86
Wyoming	392	199	51
	39,231	8,940	22.7

It will be seen from the table that, while the general rate of trachoma infection was found to be 22.7 per cent., the incidence of this disease varies greatly among Indians in different sections of the country; it varies, moreover (this the table does not show), even in different parts of the same reservation.

In Oklahoma the rate of infection found was excessively high. Among 3,252 Indians examined, 2,237, or 68.7 per cent., were found to be trachomatous. In New York, on the other hand, only two, or 0.2 per cent., of the 943 Indians examined had the disease, and it was found that these individuals had contracted the infection during their stay at an Indian boarding-school.

Other states which presented a high rate of prevalence among the Indian population, were: Wyoming, with 51 per cent.; Nebraska, with 41 per cent.; Utah, with 39 per cent.; Arizona, with 24 per cent., and New Mexico with 22.38 per cent.

PREVALENCE OF TRACHOMA IN INDIAN BOARDING-SCHOOLS

The prevalence of trachoma in Indian boarding-schools was naturally deemed of the highest importance in these investigations. The federal government looks on the boarding-school as its chief agency in raising the Indian's plane of civilization and in fitting him for citizenship. The conditions inseparable from institutional life are so favorable to the propagation of communicable disease that the question of the prevalence of trachoma in Indian boarding-schools was carefully gone into.

Data from 133 of these schools were collected and tabulated with the following results:

Out of 16,470 pupils in Indian boarding-schools, 4,916 cases of trachoma were found, a general percentage of 29.86. The highest percentage found was reported at the Rainey Mountain School in Oklahoma, where, out of 114 pupils examined, no less than 105, or 92.10 per cent. were found to be trachomatous, and the incidence of trachoma in the Indian boarding-schools of this state was found to be 69.13 per cent. Only three schools, of the entire number visited, one in Wisconsin and two in New York, were found to be free from trachoma. This is accounted for by the fact that no trachoma was found in the Indian population from which the inmates of these schools are drawn.

Classifying the schools according to the percentage of trachoma, it was found that in two schools over 90 per cent. of the pupils were trachomatous; in eight from 80 to 90 per cent.; in ten, from 70 to 80 per cent.; in nine, from 60 to 70 per cent.; in eight, from 50 to 60 per cent.; in eight, from 40 to 50 per cent.; in seven from 35 to 40 per cent.; in twelve, from 30 to 35 per cent.; in fourteen, from 25 to 30 per cent.; in ten, from 20 to 25 per cent.; in seventeen, from 15 to 20 per cent.; in eleven, from 10 to 15 per cent.; in ten, from 5 to 10 per cent.; and in four, from 0.5 to 5 per cent. In three schools only was no trachoma found. In eighty-eight schools, or 66 per cent., of the total number examined, 20 per cent., or more, of the pupils were found suffering from trachoma.

The percentage of trachoma incidence in boarding-school pupils, in general, 29.86 per cent., is considerably higher than that found for the total number examined (22.7 per cent.). The rate was also observed, in reservation boarding-schools, generally to be higher than in the reservations from which the pupils are drawn; while in the non-reservation boarding-schools, which are not located in reservations, but receive Indians from various parts of the country, it was found that groups of pupils from areas where trachoma is absent, or but slightly prevalent, showed a high rate of infection.

We are justified therefore in inferring that the Indian boarding-school has been an important factor in the dissemination of trachoma among the Indians.

PREVALENCE OF TRACHOMA IN INDIAN DAY-SCHOOLS

In addition to reservation and non-reservation boarding-schools, the government maintains Indian day-schools on the several reservations. The incidence of trachoma in day-school pupils was also investigated. The data collected were not so complete as those for boarding-schools because many of the camps were visited on days when the day-schools were not in session and others were located in inaccessible situations.

Nevertheless 3,488 day-pupils were examined and 752 cases of trachoma were found, a percentage of 21.55. The Indian day-pupils of Arizona were found to show the highest incidence, 41.3 per cent. of 990 Indian day-school children suffering from the disease. This is greatly in excess of the general rate (24.9 per cent.) found for the state.

On the other hand, in New York, out of 335 pupils examined, none had the disease. In no other state where Indians were examined were the day-school children free from trachoma.

If we exclude from the total just mentioned the relatively large proportion of New York day-schools pupils in whom no trachoma was present, the rate of prevalence, exclusive of this state, works out at 24 per cent.

This is in excess of the general average found for the total examination, but is considerably below the percentage found in boarding-schools.

The prevalence of trachoma in Indian day-schools seems to correspond fairly well with the general rate for reservations on which they are situated, and serves further to strengthen the inference that the higher rate of trachoma found in Indian boarding-schools is due to its spread among the inmates of those institutions.

PREVALENCE OF TRACHOMA AMONG RESERVATION INDIANS

Reservation Indians are considered to be Indians living on reservations and not examined in boarding-schools or day-schools. Their number included children below the school age and adults. During the course of the investigation 17,822 Indians of this class were examined with the result that 3,064, or 17.2 per cent., were found to be afflicted with trachoma. The majority of these individuals were examined either in the course of house-to-house inspection, or advantage was taken of gatherings at agencies and subagencies for the distribution of rations and the like.

The prevalence of trachoma in this group is seen to be distinctly below the rate found for the total number examined, the boarding-school rate and the day-school rate. On the other hand, by reason of the greater average age of the individuals and the consequent longer duration of the disease, most of the instances of visual damage were found among their number. The percentage of trachoma incidence noted for the various states varied from 60.40 per cent. in Oklahoma to 0 for New York and Florida. Other states with a high rate of prevalence were Utah, with 39.2 per cent.; Wyoming, with 37.26 per cent.; Nevada, with 36.5 per cent., and Montana with 30.76 per cent. It is worth noting that, in this state, the rate of prevalence among reservation Indians was found to exceed that in the boarding-schools and day-schools. States with a low rate of prevalence were Michigan, with 1.21 per cent.; Wisconsin, with 4.39 per cent., and North Carolina, with 5.45 per cent.

It is evident, as a result of these investigations, that there is a very high rate of trachoma prevalence among nearly all the Indians of the country.

INCIDENCE OF TRACHOMA ACCORDING TO AGE, SEX, AND DEGREE OF INDIAN BLOOD

It may be of interest to give a few figures as to the incidence of the disease according to the age, sex, and degree of Indian blood of those affected.

Age.—Of over 2,000 cases of trachoma in a group of 10,425 Indians examined, in which records with respect to age were kept and compiled, 4.5 per cent. were under 6; over 50 per cent. between 6 and 20 years of age, and the remainder over 20 years of age. It is evident from the preceding that those of school age are the greatest sufferers. The disease is very rare in infants under 1 year of age yet a few cases were found among babies less than 12 months old.

Sex.—In this same group of 10,425 the incidence was found to be slightly higher in females than in males. Of this total number 5,303 were males with 984 cases of trachoma, and 5,122 were females with 1,083 cases. The somewhat greater incidence among the females is only natural in view of the more domestic life of women and their more intimate association with the members of the family.

Degree of Indian Blood.—From the observations made, it was evident that the incidence of trachoma was greater among the full-bloods than among the mixed-bloods examined. This may be attributed, however, to the more prosperous circumstances and the better living conditions which obtain among the mixed-bloods.

VISUAL DAMAGE DUE TO TRACHOMA

A complete census would have been necessary to determine the total amount of blindness due to trachoma among the Indians. Certain observations, however, were made and compiled in the case of 23,560 Indians examined. Of this number 5,505 or 23.4 per cent. had trachoma of which 527 showed, at that time, marked damage to vision. These injuries were of the usual type and consisted variously of corneal ulcers, corneal opacities, pannus, entropion with keratitis, perforation of the cornea with resulting evacuation of the contents of the globe, etc. In 141 individuals the damage consisted of blindness in one or both eyes.

These figures by no means represent the extent of visual damage among the Indians due to trachoma. It should be borne in mind that, in relatively few cases, among those of school age, had the disease progressed sufficiently to produce corneal complications, and the schoolchildren, numerically, were the largest class examined. Moreover, Indians suffering from marked visual disturbance were least accessible to examination and some of these unfortunates evaded the examiners because of their sensitiveness in regard to physical deformities, particularly blindness.

At least 90 per cent. of the complications found in the Indians I examined were observed in the reservation Indians, exclusive of school-children. This is only natural in view of the long duration and chronicity of the disease.

With respect to the types of the disorder encountered, a wide variation was observed, many of the cases being mild and easily amenable to treatment, while others were of the utmost possible severity.

ORIGIN AND DURATION OF TRACHOMA AMONG THE INDIANS

The length of time trachoma has existed among the Indians is purely a matter of speculation.

The finding of cases in which cicatricial tissue only was present, the fact that aged Indians with trachoma stated that they had suffered from "sore eyes" all their lives, the history given by some of having contracted the disease from a subject long since dead, lead us to suppose that the disease has been among them for at least a generation.

Clark is of the opinion that trachoma is doubtless of more recent origin than tuberculosis among the Indians, but has existed for many years.

So, while there is no question but that the disease is widely disseminated among the Indians and has existed for years, the source and date of its introduction must be conjectural.

INSANITARY CONDITIONS AMONG THE INDIANS AND THEIR BEARING ON THE PREVALENCE OF TRACHOMA

Climatic Influences.—Generally speaking, Indians inhabit healthful sections of the country, and the large majority of Indian reservations are situated where the soil is fertile, the elevation high and the percentage of sunny days great throughout the year.

The scanty annual rainfall, however, and the high winds lead to the occurrence of numerous dust storms. Added to this is the activity of the sunlight due to the great percentage of sunny days, the lack of trees, and the greater content of ultraviolet rays by reason of the high elevation of most Indian reservations. Many Indians were encountered during the investigations whose eyes were sensitive to light and who sought protection by the use of smoked glasses. The irritation due to excessive light and dust leads to the frequent rubbing of the eyes with the fingers, thus rendering easy the transfer of infection from fingers to eyes.

The excessive severity of the winters also contributes to the dissemination of trachoma, as the Indian remains indoors a great deal during the cold season, in order to keep warm, and the personal contacts in his crowded cabin are prolonged and intimate.

Housing Conditions.—In his savage state the Indian lived an open-air, nomadic life and his tepees, while often dirty, were well ventilated.

Since the middle of the nineteenth century, however, the Indians have been confined to reservations and constrained to live in houses. They are still generally ignorant of the elementary principles of domestic hygiene required by a stationary abode. This does not apply, however, to all Indians, many of whom were found to be of unusual intelligence and good sanitary habits.

Their houses together with their domestic and social habits, however, play an important part in the dissemination of trachoma. The typical Indian house is a small, one-roomed frame or log structure, which, in over one-half the instances has a dirt floor. The average Indian family is large, four or five children being by no means uncommon. Personal privacy is generally unknown, and all live and sleep together in the crowded cabin whose doors and windows are carefully shut in the winter, for warmth, the windows being frequently nailed shut. Whatever washing of the hands and face takes place is done in a common wash-basin, and towels, when present, are used by all members of the family. The bed-clothing, consisting of quilts and blankets, is used, without washing, until worn out, and indiscriminately by the various members of the household. The scanty accommodations of the crowded cabin are likely to be further strained by the advent of visitors who, with true Indian hospitality, are welcomed and may stay days or weeks.

Discharges from the eyes and nose are usually removed by the fingers, which are inadequately wiped on the clothing or any convenient object. It was no unusual sight to see a trachomatous mother removing the secretion from the corners of her eyes with her fingers, and then endeavoring to assist the examiner in examining the eyes of her children.

Add, in the summer time the presence of numerous flies, and the sociable nature of the Indian which delights in visits and social gatherings of all kinds, and the wide-spread prevalence of trachoma among the Indians is readily accounted for.

THE PUBLIC HEALTH SIGNIFICANCE OF THE PRESENCE OF TRACHOMA AMONG THE INDIANS

The public-health significance of the presence of trachoma among the Indians has now become of considerable importance.

In former years the Indians were closely confined to their reservations and their intercourse with the white race was scant. The presence of trachoma among the Indians, at that time, while deplorable, wrought no injury to others than themselves. At present, conditions are about to be greatly changed. County after county on Indian reservations is being opened to white settlement, and the day seems not far distant when the Indian will be merged in the general population. An infection, therefore, which menaces one of the essential senses of the body seems on the eve of being widely spread through territory in which, at present, it is confined to restricted areas.

In justice to the officers of the Indian service it should be stated that they are cognizant of these conditions and are doing what they can to control them. They have been hampered by lack of men and money, but have asked for liberal appropriations to control the spread of trachoma and treat those so afflicted. It is to be hoped that such funds will be forthcoming in the near future. In the meantime they have placed what men they could in the field to treat eye diseases among the Indians, and agency and school physicians in general are on the watch for the disease and treat as many of those afflicted as they can.

CONCLUSIONS

1. Trachoma is exceedingly prevalent among the Indians, the prevalence being (a) highest in Indian boarding-schools, (b) less in Indian day-schools, and (c) least among reservation Indians above and below school-age.

2. The origin and duration of the infection among the Indians is unknown, but its wide dissemination is readily accounted for by the housing conditions and want of the knowledge of personal hygiene among them.

3. The opening of reservations to white settlement and the foreshadowed absorption of the Indian by the white population renders the present wide-spread diffusion of trachoma among the Indians a serious menace to future white populations of Indian reservations.

TRACHOMA AMONG THE NATIVES OF THE MOUNTAINS OF EASTERN KENTUCKY

J. A. STUCKY, M.D.
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For more than twenty-five years, a large and rapidly increasing number of cases of trachoma, with many of the devastating sight-destroying sequelae, have been coming to me from the mountains of eastern Kentucky. I was impressed with the genuineness, the simplicity, honesty and sincerity of the large majority of those so afflicted—and the fact that very few of them had the first rudiments of a common school education, indeed, few of them could read or write, and many were unfamiliar with the alphabet. Often I would see the patients only once—there being no funds to maintain them or provision of any kind available for keeping them in the hospital for treatment. After a few months many of them would return with complete destruction of the eye or with impaired vision beyond restoration.

Besides this class of cases many were brought with most extensive and complicated suppuration and destruction of the middle ear and mastoid process, with systemic, meningeal, auditory and psychic sequelae—also cases of pansinusitis of the nasal accessory sinuses, some with involvement of the anterior frontal lobe (the silent area) of the brain.

All of these cases came from an area in the heart of the mountains composed of seven counties. After investigation I found most of these counties were so-called "pauper counties"—with no money in the county treasury, and not so much as an almshouse. My "scientific curiosity" was aroused as to the source of the infection, the conditions and surroundings under which these people lived, and in the physical and sanitary conditions of the people with whom they associated. My first trip of investigation, lasting four days, was made in the fall of 1910. Going over the Lexington and Eastern railway to a station 84 miles away from my home, I went muleback 27 miles into the interior of the mountains and held a clinic for two days. The following April (1911) I established a clinic at Hindman, Knott Co., Ky., which was then 45 miles from the railroad, making the trip on muleback, accompanied by two nurses, a guide and a pack mule to carry all our clothing, hospital supplies and instruments for a four days' clinic. It took nearly two days to make the trip, much of which could not be adequately described.

Three elements which constantly presented themselves on this trip, and which kept us on the qui vive from the start to the finish were the element of (1) uncertainty, (2) expectancy, (3) danger. More detail cannot be given than this at this time, but this much may be said that my "scientific curiosity" and desire for investigation was liberally paid for in these three elements, in the hard, rough, grand and many times enchanting journey.

The clinic was founded in connection with the W. C. T. U. Settlement School established at Hindman, one of the most remote and inaccessible parts of the mountains, and has been conducted semiannually since. As the result of examinations and conditions found among the natives, who in large numbers attended the clinics, I made my first report to the American Academy of Ophthalmology and Oto-Laryngology at Indianapolis, September, 1911, at the same time exhibiting a number of photographs taken at the clinic.

Figs. 1 and 2.—Groups of trachoma patients.

As the result of the discussions and suggestions made at the time, I later made the same report and exhibit of photographs to our State Board of Health. At the annual meeting, in Louisville, of the sanitary and health officers of the cities, towns and counties of Kentucky, I was appointed to represent the state, in connection with Dr. John McMullen of the U. S. Bureau of Public Health, to investigate the infectious diseases of the eye and other sanitary conditions in the mountains. Our reports have been made and published in Bulletin 101 of the Bureau of Public Health reports. I presume that it is because of this report that the Section devotes this time to a symposium and discussion of the most prevalent, infectious and dangerous disease of trachoma, found in such large numbers among the natives of the mountains of eastern Kentucky.

In order better to appreciate the report of the U. S. Bureau of Public Health and to accentuate the importance of the situation and condition a very brief description of the people and their method of living must be given. Emerson Hough [1] correctly gives the desired information — though the location of the Hindman clinic, where my observations were made, is fully forty miles further into the interior or heart of the hills. Hough says:

> In the Cumberland Mountains of Kentucky there are no roads; the only viaducts are aqueducts, the creekbeds, which have known no shaping by the hands of man. When the bottom of the creekbed becomes impassable, the trail climbs over the shoulder of the bank. Sometimes it crosses from one creek valley over a summit into another valley, and so works its way back sinuously into the hills; a narrow trough, it has no culverts, no bridges, no drainage. When you bog down, you get a rail and hoist out your wagon.
>
> Here live people of arrested development who have always remained Americans. Since the days of Daniel Boone they have been thus unchanged—not laborers, operatives, or salaried folk, but soil-owners and home-makers. These are by no means the "poor whites" of the South, by no means the shiftless Cracker sort, but a keen, bold breed of men, who remain of the Revolutionary type even to-day. These Americans belong to us, and we owe much to them. There are half a million of them waiting to be discovered as American citizens.

> You can go back into the Cumberland country and find the trail where Boone crossed, following the waters, and see that region pretty much as he found it and as he left it, a country with a history arrested, unwritten, waiting. The log cabin is the universal form of the home. You can find to-day the loom, the spinning-wheel, the lard-kettle, the candle-mold, the squirrel-rifle, unchanged in a hundred years. The women there still wear sunbonnets, and they still ride behind, horseback, with their lords and masters; still stand waiting at table while their lords and masters eat.
>
> Strange old Elizabethan phrases of speech still linger. Hot bread still prevails, three meals a day, and pork when they can get it. The men do not go west to pick up prairie lands, but toil laboriously with the ax on steep mountainsides to open the land, plow it precariously with single-shovel plows, or till it laboriously with hoes—men, women and children. Farm machinery is unknown.
>
> You cannot believe, and surely cannot understand, these things without seeing them—cannot believe that this backward country is in America as you know it. But, having seen them,

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[1] Hough: American Magazine, December, 1912.

you understand why these side-tracked highlanders, lost for more than a century, do not send their children to school. There are no schools, because there are no roads; no roads, because there are no taxes; no taxes, because there is no money; and, coming round again in a circle, no possible interchange of commodities, because there are no roads. There lies the wilderness of the old crossing-place of the Alleghanies as Boone saw it and left it.

In this country you still see the old American type. The men are tall and sinewy, for the most part quiet in habit, slow of speech. Though marrying young and soon aged by hard work, the women are delicately beautiful of face and figure, the children being especially very beautiful. They have nothing of the vacuous "poor white" look, and have not the slightest resemblance to the stolid peasants of Europe.

You will find grown men, of powerful body and powerful mind, with an exactness of estimate, a breadth and justice of *mental view, simply astonishing; yet perhaps their total book* knowledge will not equal that of a 5-year-old child in communities more fortunate. It is a state of affairs singular and almost unbelievable in our country. I call it a white bondage for lack of a better term. It is simply arrested civilization. Have a look at the population we meantime have imported from the rest of the world in place of these!

In these little cabin homes and rude shacks, windowless, with no opening to the single room but the one door, with a lean-to for a chimney or piece of stove-pipe thrust through the side or roof, live the entire family of from eight to twenty. In this room they eat, sleep, cook — live. They all use the same large family towel for days, and this undoubtedly is one of the greatest sources of infection. The method of living is suitable for the propagation of any contagious or infectious disease.

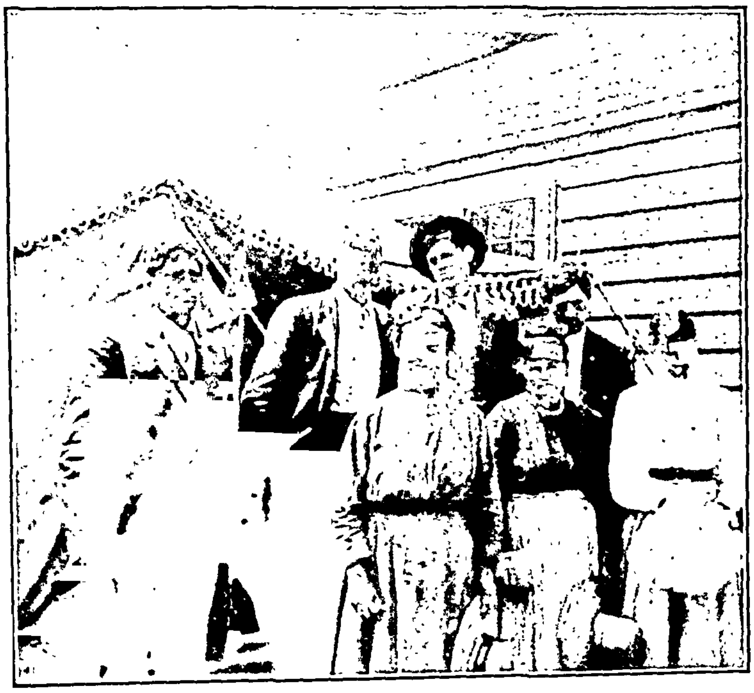

Fig. 3.—A group of trachoma cases with corneal and lid complications.

In none of my clinics and on none of my tours of investigation have I met very many cases that I could with confidence diagnose as acute trachomatous infection. The disease, as I have found it, has been chronic, sometimes with months or years intervening between the time of its incipiency and the terminal stage of cicatrization with one or several of the inevitable sequelae. Omitting reference to the initial stage, I have found and treated hundreds of cases of the second and third stage.

In the second stage the palpebral conjunctiva is not only hypertrophied but often studded with granular masses, or granules, undergoing destruction which causes a rough and uneven surface, so characteristic of the disease. It is in this stage that the tarsal cartilage becomes thickened, that newly formed blood-vessels appear in the cornea, resulting in vascular keratitis or pannus, ulceration and trichiasis, and then begins the real suffering complicated with impaired vision, photophobia, lacrimation and discharge of mucoid material which later becomes mucopurulent.

The third stage I found in large numbers of the natives where connective tissue has replaced the palpebral conjunctiva, the tarsal cartilage becomes atrophied (in many instances almost completely destroyed), the result being that the lid is no longer held in its normal position, and the lashes are turned inward and upward, further irritating the already inflamed cornea, thus giving the appearance of frosted ground glass. It is in this stage that the ulcerations of the cornea assume a virulent condition, frequently perforating and emptying the anterior chamber, terminating in adhesions of the iris and lens to the cicatrized cornea. This is one of the sequelae of the disease that I have found for which our science and art offers no hope of amelioration or relief. A much larger number of cases than those just referred to are found, in which from one to two-thirds of the posterior palpebral surface is firmly adherent to the eyeball, a condition known as symblepharon. While this is more frequently met in those past middle age who have had trachoma since childhood I have records of twenty-seven cases in which the patients were under 30 years of age.

Fig. 4.—"Too late"—the husband blind from trachoma and the wife with only one-third vision, from the same cause.

There can be no doubt of the infectiousness of the disease. Extremely rarely did I find only one case in a family. The nature and method of preparing the food, everything being cooked in grease, or boiled — the large quantity of sorghum molasses and hot soggy bread consumed — all tend to impair digestion and cause vicious changes in metabolism, which lower the vitality and body resistance, and make the inhabitants easy victims to hookworm infection — which the majority of them have. Also the insanitary and unhygienic cabins and huts in which the natives live, large families sleeping huddled together in one windowless room, all of them using for many days the same family towel, which hangs on the door frame, easily accounts for the spread of the disease.

While I am convinced that it is a communicable disease there exists in some a strange and marked immunity which I cannot explain. Again, in many instances I have met with most active and violent inflammatory exacerbation of the disease in a chronic case, in which one eye only was involved, no disease or "soreness" ever being noticed in the opposite eye. I have met families from three to nine members of which had the disease, while one or two members had slept, eaten and lived for months and years with them, even using the same dirty, trachoma-laden towels to dry their faces and hands, and I have seen other instances in which one eye was dangerously involved with the disease and the opposite eye normal; I am therefore forced to conclude there must be some condition of the conjunctiva in one eye, or in both eyes of some, that creates an immunity to the disease.

I believe that trachoma is due to some organism or bacillus. That it has not yet been discovered and a specific remedy found for its destruction is a reproach to the science and art of bacteriology and ophthalmology.

The disease, as I find it in the mountains of eastern Kentucky, is in no way related to the gonococcus, spirocheta or tubercle bacillus, nor is it carried by flies, because there are surprisingly few flies to be seen.

In the last four years, semiannually riding hundreds of miles on muleback or in a springless mountain wagon, stopping at their humble cabin homes for water or direction as to the right way of going, or sleeping in them when overtaken by night, or when the journev was stopped by the sudden "rising of the creek or river," as the result of a heavy rain which made it unsafe to attempt to ford, I have seen numbers of cases of trachoma, as evidenced by the gummy appearance of the edge of the eyelids, or by ptosis of the upper eyelid, photophobia or profuse lacrimation. The answer to my first question would be "'Twarn't nothin' much, only jes' sore eyes, which git powerful weak at times." The reply to my question, "How long have you had sore eyes?" would be, "Oh, I've follered having sore eyes fur quite a spell, they gits purty nigh well some times, then they busts out wus' than ever."

Such patients do not come to my clinic or seek medical aid, because the pain is not great enough or vision sufficiently impaired to prevent their making the "craps" or "lumberin'" — and live they must. With no knowledge of agriculture or latter-day farming it is hard for the best of them to eke out an existence; they succeed at best in making scant crops because of washed, gullied and unkept soil. Hence they are insufficiently and improperly fed and clothed because they do not know how to prepare and cook food, and have not the means, facilities or opportunities for getting the right kind of clothing for their bodies.

The pathos and tragedy of the condition of the natives in the mountains of eastern Kentucky is that, if they ever receive help of the educated citizen, such help must be carried to them, because they are mountain-locked; are misunderstood and misrepresented, have been crowded back by civilization, and have never "had a fair chance or a square deal."

The conditions as revealed by the facts and figures of the United States government reports of Nov. 8, 1912 (Public Health Bulletin No. 101), are shocking and appalling. This report says that of over 4,000 people examined in five counties 12.5 per cent. had trachoma.

To my semiannual clinics only those patients come with the most painful forms of the disease—those so diseased as to be practically incapacitated from household or other labor. Of the 374 cases seen at the clinic in September, 1912, 113 had trachoma; 40 per cent. had corneal complications; 25 per cent. had photophobia; 10 per cent. had entropion; 2.5 per cent. had symblepharon; 25 per cent. had impaired vision, ranging anywhere from slightly defective vision to total blindness, all those were sequelae of the disease.

The trachomatous patients ranged all the way from small children in mothers' arms to old age. Trachoma patients coming into our ports from Europe are quarantined and forbidden citizenship; and yet, of the 114 of these quarantined cases examined by me, on Ellis Island and in Baltimore, not 0.5 per cent. were comparable in severity to the average of those I see at my clinic in the mountains. Besides the ravages of trachoma, we meet many cases of ear, nose and throat diseases, and probably more of the natives are afflicted with hookworm disease and its sequelae than any other two diseases, and until they are relieved of this there is slow and unsatisfactory response to any medical or surgical treatment for any of their diseases.

Dr. A. Von Sholly, representing the N. Y. Board of Health, who was sent by this board to accompany me on one of my visitations, for the purpose of studying conditions clinically and also to make bacteriologic and microscopic examinations in the acute and chronic stage of the disease, says:

> The situation in this country, at present, is ludicrous—we take precautions to keep out infected aliens, but cherish—at least do very little to discourage—the spread of trachoma in our midst, and worst of all amongst our oldest "American Stock" at that. That trachoma is prevalent in the mountains of eastern Kentucky and in its most destructive form is a deplorable fact, for anyone who goes there, to see, So long as the highways are sewers, the homes and public meeting-places huge cuspidors, and the common wash-basin scantily filled with water and the nearest rag the bathing equipment for the whole family and its guests—not to speak of the common bed, in many instances without sheets or pillow-slips—one cannot be surprised that typhoid fever, tuberculosis, hookworm and trachoma are rampant.

The solution of the problem of eradicating trachoma in the mountains is neither simple nor easy — it is complicated and hard, but I have no doubt that it can be done. The problem can be solved through a threefold agency, under the direction of the State Board of Health and U. S. Bureau of Public Health — this agency to be (1) the medical man, (2) the graduate trained nurse and (3) the schoolteacher. A. Von Sholly says:

> The solution of the problem is dissipation of ignorance by teaching the laws and rules of hygiene. When the belief of the mountain folk that "sore eyes" and "weak eyes" are a visitation of the Lord, to be endured with resignation, is supplanted by the knowledge of how infection is carried and what personal and family hygiene means, there ought to be no difficulty in rooting out the contagion. Illustrated public talks; illustrated pamphlets of instruction; visits to the homes by a trained nurse and social worker who has gained their confidence; clinics, such as those held at Hindman and Buckhorn, in Knott and Perry counties, which cure the early cases and give relief to those with irreparably damaged cornea, foster confidence in the mountain people toward their advisers.

In appealing for aid and cooperation in this work, I have received the reply from medical men that "it is useless for oculists to attempt the medical and surgical treatment of the disease with any satisfactory results until conditions are changed." In reply to this I want to know who is to change conditions unless it be the medical man, sanitarian and schoolteacher?

With the character of physical and mental "Anglo-Saxon American stock" to deal with in the mountains of Kentucky where trachoma is so prevalent, I feel confident that the disease can be effectually arrested and then eradicated by the methods and system used in the floating ophthalmic hospitals of Egypt,[2] as described and illustrated by photographs.

While we have made no appreciable progress in ascertaining the specific factor in the etiology of the disease, we have made great progress *in the treatment*. I consider the treatment in certain conditions to be as important as that of virulent ophthalmia, and require almost as active day and night care and judgment in the use of remedies, irrigations and fomentations. I have no hesitancy in saying that for the past three or four years in cases of trachoma, especially those with corneal complications, I accomplished more in two or three weeks with the case in the hospital, than I formerly did in as many months having the patient treat himself at home, and visit me at my office or clinic several times a week.

The old routine method of an occasional application to the everted eyelids and certain remedies to be instilled into the eye several times daily by the patient or relatives is unscientific and unsatisfactory. I know of no infection more tenacious, stubborn, uncertain and harder to eradicate than that of trachoma — nor one that requires closer observation and more careful handling, in order to save vision when impaired by ulceration of the cornea or pannus. For this reason it is essentially a case for hospital treatment and care from a humane, economic and scientific standpoint.

Probably no state has a more efficient board of health than has Kentucky, certainly none with a more competent executive secretary. Who has accomplished more for the members of this great American Medical Association than Dr. J. N. McCormack of Bowling Green, Ky.? But with the very meager financial aid at its disposal, and with no hope of an increase in the appropriation for medical and sanitary purposes in the near future, because of the state's great indebtedness, our State Board of Health has been able to give but little assistance toward the relief of the situation; hence the appeal to the U. S. Bureau of Public Health, which was promptly and most efficiently given, and whose report, already referred to, has caused such widespread interest and comment in medical journals, magazines and newspapers. Within the last three months daily trains are running through the region of this hotbed of trachoma, and the danger of the infection being carried to other towns and cities is being greatly increased.

The condition confronting the federal and state governments is one of more than intensely scientific interest — it is at once humane and economic and should not be viewed from either a political, sectarian or sectional point of view.

The result of the semi-annual clinics held in connection with the W. C. T. U. Settlement School has been most gratifying. The removal of adenoids and tonsils, the treatment given for hookworm, and active prophylactic remedial and surgical means used for the arrest and cure of trachoma, the correction of refractive errors in a very large number, especially those having trachoma, the great improvement in the general physical development and health as well as the changed mental condition of the children and their homes, is remarkable and a most hopeful indication of what could be accomplished were the work done in a more systematic and persistent manner, with improved facilities and equipment, which are sadly lacking in the cabin hospital at Hindman.

Too much credit cannot be given to the faculty and the resident district nurse, and the Board of Health at Hindman. The good work accomplished by Miss Butler, the resident nurse, in caring for infected patients and carrying out after-treatment, as well as her painstaking and tactful method of disseminating knowledge of sanitation, hygiene and the cause and methods through which infectious diseases are transmitted, is a forceful illustration of the claims which I have made for the graduate nurse.[3]

The pictures from which the illustrations were made were taken with a kodak by one of my nurses inexperienced in the use of a camera, but they give a more correct idea of the people, the disease and the conditions than I could convey by pen or speech.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. M'MULLEN, SCHERESCHEWSKY AND STUCKY

Dr. Edgar S. Thomson, New York: The two main questions brought up by this group of papers are: first, the necessity of excluding immigrants with trachoma, and second, the management of the disease among the mountaineers of Kentucky and the Indians. It seems hardly necessary at this time to lay much stress on the advisability of excluding immigrants, for its necessity has been so well shown, but I would like to express my approval of the system of fines to the steamship companies and also of the care and thoroughness with which immigrants are examined at Ellis Island, in New York City. In this connection I will read an extract from a letter from the Commissioner of Immigration:

"Between July 1, 1911, and June 30, 1912, there were certified, approximately, 720 cases for trachoma. All except 53 were deported, and an attempt to cure these patients was ordered. Of these, 16 were cured, but the remaining cases have not yet yielded to treatment. Treatment is permitted only in cases in which deportation would result in extreme hardship, as, for instance, in cases in which the immigrant has no one to go to on the other side. The present tendency of the department is to restrict to the lowest possible number those who shall be held for treatment, and as to all others to let the law take its course. Trachoma is classed by the Public Health Service as a dangerous, contagious disease, and all who arrive with it may be deported forthwith. In all cases in which a competent medical examination abroad would have disclosed the existence of trachoma, the steamship company bringing the diseased immigrant over is subject to a fine of $100. In 1902 there was no statute permitting the imposition of such a fine, and the proportion of immigrants who came to this country with *trachoma* was far greater in those days than it is now. The conditions in the steerage quarters on some of the ships were truly horrible, because the cases brought were bad ones and the diseased immigrants mingled freely with those who were not diseased and used the same towels. Of course, all such cases were deported, but the deportation expenses, being low, did not *deter steamship* companies from bringing over people with trachoma. Their surgeons used to say that they considered many of these cases to be conjunctivitis, rather than trachoma, but such a confusion of the two diseases has occurred far less frequently since Congress permitted the imposition of the $100 fine. Now we rarely see the very worst cases of trachoma, although there are still brought here many cases in which the disease cannot be eradicated, except through treatment extending over at least one year. Congress has been urged to increase the fine limit to $200, so that the steamship companies shall be deterred from bringing here any immigrants with trachoma." One of the most vexing questions in connection with the exclusion of immigrants and the necessary hardship to individuals is the question of what constitutes a dangerous case. With the pathology of trachoma in its present unsettled state, we should err on the side of safety by excluding any cases of well-marked follicles, or at least place the case under compulsory treatment until it is cured. The clinical diagnosis of trachoma follicles is a subject on which it is impossible in all cases to be dogmatic, but my own feeling is that the typical large ovoid follicle is of trachomatous origin in the vast majority of cases, and that the wide differences that we see in the course of different cases, some running a comparatively mild course and others developing a severe pannus, depends mainly on the amount of local tissue reaction present, which in turn may depend on constitutional tendencies, superimposed infections, etc. I strongly endorse a point in Dr. McMullen's paper, in which he says, in effect, that a quiescent case may at some subsequent period develop conjunctival secretion and become actively contagious and a serious menace to the community. I am willing to admit the condition of "follicular conjunctivitis," in which fine follicles are scattered all over the tarsus and retrotarsal folds, for these cases have well-marked peculiarities, but as to the mild cases with the pale oval follicle, I am inclined to the supposition that these are mild infections of true trachoma. The follicles of vernal catarrh and the other special forms of follicle have marked clinical characteristics. If such mild cases are to be admitted to the country their treatment must be compulsory. Except in rare instances, such patients leave us before the cure is completed, if the case is at all protracted. The treatment of the mountaineers and Indians must be accomplished in a different way but is a no less serious question. I think everyone agrees that while trachoma is a disease we expect more commonly to find in crowded cities, it is just as virulent in healthful country districts, where unsanitary conditions prevail. It seems to me that the great need, as Dr. Stucky pointed out, is for some sort of hospitals, or at least clinics, in these out of the way districts, where systematic and persistent treatment may finally eradicate the disease. And this applies equally to the problem in the case of the Indian. In some of its phases, trachoma is an exceedingly stubborn disease, prone to relapses and exacerbations and constant supervision of almost every case is necessary. I am strongly in favor of early expression, for I believe that this has a direct bearing on the prevalence of pannus. This is denied in some quarters, where the presence of pannus is looked on as placing the case in a somewhat different category from the ordinary class of cases characterized by follicles. We certainly see vastly fewer cases of pannus in our New York clinics since about ten years ago, when an active campaign was started in the schools and expression of the early cases was done on a large scale. It seems to me that it is not worth while to limit our activities by the discussion of any especially fine pathologic points. The important clinical facts we know and our course and duty in the matter are both clear.

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[2] Campbell, A. F.: Ophth. Rec., December, 1910.

[3] Stucky, J. A.: Another Field of Usefulness for the Graduate Nurse, Pub. Health Nurse Quarterly, January, 1913.

Dr. L. Webster Fox, Philadelphia: The paper read by Dr. McMullen might be construed as a plea for a continuation and rigid enforcement of the deportation clause of the immigration law, which provides for the exclusion from admission to the United States of immigrants suffering from trachoma on the ground that it is a dangerous, contagious disease. Dr. McMullen has shown that the proportion of trachoma cases to the total of arriving aliens has considerably diminished in one year. The only cheering ray of hope in this paper for the poor, trachomatous immigrant, is contained in the remark that although trachoma is very resistant to treatment, it is curable. Without commenting on the merits or demerits of the restrictions and penalties of this part of the immigration law, I will relate my own experience with immigrants found, on their arrival at the port of Philadelphia, to be suffering from trachoma, with a view to showing that such cases are not only curable but that a radical cure can be effected within a reasonable period. During the past year I operated on eighty-seven patients suffering from typical trachoma. Among this number forty-four immigrants who were found to be suffering from trachoma, on arriving in the United States, have been transferred across the Delaware River from the Detention Station at Gloucester to the Medico-Chirurgical Hospital in Philadelphia for prompt treatment of their condition by Dr. Oakley of the Marine Hospital Service. These cases would permit of no delay and I have therefore operated on them by the method known as grattage, which almost invariably brings about a radical cure within a reasonable time. I have practiced grattage with great success and satisfaction from the time I saw it performed by Dr. Darier, in Paris, in 1892. The operation requires, first of all, complete eversion of the lids and exposure of the trachomatous conjunctiva into every part of the culdesac. This is easily effected by means of the Darier forceps, which resemble a catch dressing-forceps with three pins on the male blade. The roughened, thickened, congested conjunctiva is next thoroughly scrubbed with a tooth brush dipped in a solution of bichlorid of mercury, 1 to 2,000. With a three-bladed scarificator, the whole of the palpebral conjunctiva is then scarified, and by means of gauze sponges it is rubbed until the whole of the palpebral surface of the lid is perfectly smooth. Although this seems to be a somewhat formidable procedure, it is surprising how quickly the swelling subsides under the use of antiphlogistic and cold applications and the patient is cured of trachoma. All of the forty-four immigrants referred to were discharged as is shown by Dr. Oakley's official report. This method of treating such cases is so radical that recurrence of the trachoma is unusual. In addition to the grattage, it is advisable in some cases to perform Burow's operation, or to excise the tarsus. The results obtained by this line of treatment have been so satisfactory that the individuals referred to, who had traveled many thousands of miles to join their friends and families in this country, are no longer a menace to the health of the community, and have been humanely saved from deportation.

No record of time in two cases.
1 case in hospital 9 days
2 cases in hospital 10 days
1 case in hospital 12 days
3 cases in hospital 13 days
5 cases in hospital 14 days
2 cases in hospital 15 days
4 cases in hospital 16 days
6 cases in hospital 17 days
26

5 cases in hospital 18 days
3 cases in hospital 19 days
1 case in hospital 20 days
1 case in hospital 21 days
1 case in hospital 23 days
2 cases in hospital 24 days
1 case in hospital 25 days
14
26
40 cases released to date, 6/3/13

Dr. F. Park Lewis, Buffalo, N. Y.: The question of the control of trachoma naturally resolves itself into two parts, the protection of our ports from immigrants, and the protection of those who are already within the country from the ones infected. Four years ago in Naples I made some investigation of the methods then used to prevent immigrants who had trachoma from attempting to leave Italy. I found that the steamship companies refused transportation to five thousand people each year because they had trachoma, knowing that the penalty would be the re-transportation of those infected. I believe we need give little attention to our ports of entry. The United States government is fully alive to the importance of this phase of the subject, and is, I am sure, giving us adequate protection at these points. The vital question is the localization and control of trachoma now in the United States, and the further determination as to whether these centers are broadening, and there seems to be very little doubt in regard to this. In every school for the blind in the United States, except that of Arkansas, the chief cause of blindness is ophthalmia neonatorum. In Arkansas the chief cause is trachoma. The eastern and southern portions of the state are almost free. In the Arkansas School for the Blind there were 199 white and 28 colored pupils enrolled. The last report shows that the number of cases of blindness from trachoma is 115, which demonstrates that in Arkansas and in adjacent Missouri there is an enormous amount of active, acute trachoma, a thing of great importance to be determined. In the second place, we are finding cases manifesting themselves in various isolated localities. A few years ago it was unusual to find trachoma in western New York. Dr. Kerr said that trachoma among the Indians in New York was in the proportion of 0.2 per cent, and yet I think it is the experience in western New York, among the ophthalmologists, that gradually new, acute cases are appearing from time to time. In Oklahoma the infection among the Indians is rapidly spreading to the white population. The white schools have already become infected, to the extent of more than 25 per cent., as I think Dr. Kerr has shown. Every active case of trachoma should be reported officially to the health departments of the several states. Until the extent of the disease is known we are as helpless as we would be with any other infectious disease, such as small-pox, if it were scattered over areas over which we had no control. In the second place, our treatment of these conditions consists of after-hospital or dispensary care for a large proportion of the cases. The patients with acute cases appear in the hospital and dispensary, then go back to their homes when they again act as sources of infection. Until we can use the social service of various philanthropies in these localities, by following the people into their homes and using measures to prevent infections, we shall not secure control of this menacing disease.

DR. S. D. RISLEY, Philadelphia: Viewed from the sociologic aspect, I recall the fact that only a week or ten days ago I noticed in a newspaper that the strikers in the Kanawha region of West Virginia were being replaced by mountaineers from Kentucky, and if these mountaineers are from the district infected with trachoma, it is important from the hygienic standpoint to control the matter since it might spread from them into the mountains of West Virginia and thence into the population throughout the entire region.

DR. GILBERT E. SEAMAN, Milwaukee, Wis.: The kind of work Dr. Stucky is doing and this kind of a situation are moving illustrations of the fact that the handling of a dangerous, contagious disease is a matter for state or national government. It would of course be foolish to expect a few individuals, led by even as enthusiastic a man as Dr. Stucky and the organization in Kentucky, to cope with this situation without the aid of the government. I did not understand from Dr. Stucky's paper that the state of Kentucky was doing its share in this work. I believe, from a somewhat full experience in a district populated by foreigners, that the inspection at the port of New York and at the other ports is not so effective in keeping out trachoma as we might think. We have, in the city of Milwaukee, a large immigration from southern Europe at the present time. We have not a very great proportion of cases of trachoma, but the cases we do see are among that class of people, and generally among people who have recently come from Europe. I have observed the inspection, not in recent years, but formerly, at the port of New York and at other ports, and I do not think sufficient time is given to the attempt to make a diagnosis. It is not an easy matter to make a diagnosis in the early stages of trachoma, and I believe that many of the cases get through at the ports that might be diagnosed and properly handled and treated if more time were given to the particular matter, and probably more expert observation in some instances. But what I particularly wish to emphasize is that without the help of the government—and when I say the help of the government I mean financial aid and the organization that comes from financial aid—such a situation as that in the mountains of Kentucky cannot be adequately handled. The highest function of government, I believe, is the preservation of the lives and health of its people, and I would not hesitate, if I were Dr. Stucky and so situated, to ask the state of Kentucky to provide all the money necessary and insist on it. I believe the lecture of Dr. Stucky, if delivered to the people of Kentucky and to the legislature in session, followed by a request for funds, would bring forth financial aid. It is, however, a very difficult matter to get sufficient financial aid for proper health work.

DR. WILLIAM ZENTMAYER, Philadelphia: I wish to bear testimony to the effectiveness of the examinations at the port of Philadelphia. Some five years ago my assistant, Dr. Dewey, at the Wills Hospital, took occasion to go over the records for the previous twenty years during which there were from ten to eighteen thousand new eye cases. He found that twenty years ago 9 per cent. of the cases were trachoma, while twenty years later the percentage had fallen to 0.9 of 1 per cent., and that was five years ago. Dr. Risley and myself were on the Committee of "Annual Report" of Wills Hospital this year and we were struck by the infinitesimal number of plastic operations called for by trachoma. It was almost negligible. Then I was very glad to hear Dr. Fox speak of the cure of trachoma. I was taken to task recently in a published article for my optimistic views on trachoma. I had expressed the opinion that in my experience the damage to the eyes from trachoma had rarely been so serious as to incapacitate the patients for work. It may be because of the thorough examination at our ports that we have been fortunate in seeing very mild cases in Philadelphia.

DR. LUCIEN HOWE, Buffalo, N. Y.: I do not think the statement made by Dr. Fox should be allowed to pass unchallenged. We have all practiced grattage, we have all curetted, but I found it practically impossible to obtain a cure in some cases, at least within a few years. My second point is in regard to the number of cases in our midst which have entered through Ellis Island. I think all who have a large foreign population to deal with appreciate this fact. If you doubt what has been said in regard to the superficial character of the examination at Ellis Island, you can be very much enlightened by spending a day there. It is practically impossible to diagnose these cases among the immigrants who come by thousands, as they pass in the line. A great many will necessarily slip through. But if congressmen can be interested in the Dillingham bill, a large number of these cases of trachoma can be shut out. This bill provides practically for the illiteracy test, and requires that the immigrant shall be able to read a certain number of sentences in his own language. I commend this bill to your careful study. It strikes at the root of this trouble. You and I see the effects of this disease and we appreciate them. The majority of the people do not. Your congressman does not, but if each of you will appeal to your congressman and show him the effects of this disease, then this discussion will have point and will have produced some results.

DR. M. WIENER, St. Louis: At the Oklahoma state meeting a few weeks ago I heard a great deal of discussion among the ophthalmologists as to the method by which the examination for trachoma was conducted. I am not speaking from experience, but I should like to ask Dr. Kerr and Dr. McMullen what are the preparation and the qualifications of the examiners who reported on these cases of trachoma. The ophthalmologists in Oklahoma held that there were a great many cases called trachoma which were not trachoma. The health authorities of St. Louis have requested the ophthalmologists to report trachoma and ophthalmia neonatorum.

DR. EDWARD JACKSON, Denver: A trachoma investigation was made of the 225 inmates of the State Home for Dependent Children, in Denver. A physician who has done a large amount of work examining schoolchildren reported that, on examination, over a hundred had trachoma. Those that were diagnosed as having trachoma were sent down to the clinic and examined by Dr. Coover, who found thirty cases. A single examination for trachoma can only show the acute and severe cases. I suppose that those in charge of the inspections at Ellis Island and elsewhere only feel justified in excluding cases that are more or less pronounced. Cases are constantly coming in that can hardly, with justice, be excluded, and yet may develop acute exacerbations and become centers of infection. I agree with Dr. Zentmayer that the work at the immigrant stations is being done extremely well and has accomplished much good. When I was serving at Wills Hospital twenty years ago, nearly all our cases of acute trachoma were in immigrants, of two or three months' standing. They had apparently been infected during the passage. But it only furnishes a starting-point for a campaign against trachoma. A year ago I talked with the chief medical officer of Porto Rico. Trachoma was one of his most serious problems, although there was very little trachoma in Porto Rico. It was not serious because immigrants from other countries brought it in, because he could easily manage them, as they are managed at the immigrant stations in the United States. but it was serious because citizens of the United States were continually coming from the United States and bringing trachoma with them. There has been considerable agitation in Austria-Hungary against the return of those who have been in America for several years, and have become infected with trachoma, and are bringing it back into that region and increasing the amount of trachoma, according to the ophthalmologists. The same agitation has been started in certain parts of Italy on the same account and it is proposed to impose restrictions on such return. The question has certainly reached the stage in this country at which the suggestions touched on by Dr. Lewis are proper — to recognize every case of actual trachoma in the community and treat it as a contagious disease, and to adopt measures that will relieve us from such centers as those on the Indian reservations and in the mountains of Kentucky, and in parts of Missouri, Arkansas and Oklahoma among the white population. That means a campaign for legislation in several states for placing trachoma among the recognized contagious diseases that are a serious menace to the public health.

Dr. Frank Allport, Chicago: It has been suggested that a fund be set aside by the legislature for the relief of trachoma, for instance, in Kentucky. We have some wealthy states in this country where money can be set aside—New York, Illinois, Pennsylvania and various other states—but without any disrespect to Dr. Stucky I may say, and I think he will endorse it, that Kentucky is a poor state, and even this pathetic and heart-rending lecture might be delivered to the legislature of Kentucky without any financial results whatever. Not that they would not be willing, but they have not the means, and there are many states in the South and Southwest where an appeal for funds would be useless for the same reason. We will have to raise money in other ways, either by national legislation or charitable contributions, or by funds furnished by some such organization as the Russell Sage Foundation. Dr. Fox's statement with regard to the curability of trachoma has been made, I believe, with due deliberation and experience. I have seen dozens of cases under Dr. Fox's care at the Medico-Chirurgical that have been cured. I do not believe Dr. Fox would say that all cases can be cured, but most of them, either with thorough grattage, such as we all perform, or with removal of the cartilage. Of course the effects such as rupture, staphyloma, etc., are not going to be cured, but I feel that the vast majority of these cases can be cured so that they are placed on the non-contagious side. I speak not only from observation in the clinics, but from my own observation and experience, which of course is limited. because we do not get a great number of such cases in Chicago.

Dr. J. S. Lichtenberg, Kansas City, Mo.: In explanation of the fact that some of these immigrants get by the inspectors at the ports of entry, all of us who have been abroad have seen numbers of these patients in the various clinics treating for trachoma with the intention of coming into the United States. At Moorfields. there is a special room for trachoma, and most of the patients. I was told when there, expected to become immigrants. They are apparently cured. The evidence of the disease is so slight that it cannot be detected. They then come into this country and have recurrences and become foci of infection.

Mr. Henry Copley Greene. Boston: In our experience in Massachusetts we do not find a great deal of blindness due to trachoma. At the same time a certain number of cases of trachoma do slip through in spite of careful inspection at the ports. If an immigrant at the time of landing is liable to become a public charge within three years, he may be deported, and for the preservation of our own citizens it seems very important that the law should be enforced. During the last administration there was a certain amount of what I call sentimentalism about the deporting of immigrants. In these cases with low vision the people do not all go to Dr. Fox or some equally eminent practitioner. They slip in, their eyes are neglected for considerable periods, and they become, not totally blind, but so much disabled that they cannot earn a living. I think that oculists can help the immigration authorities and help in the protection of the community by seeing to it that these patients, who, at the time of landing are liable to become public charges, are deported.

Dr. John McMullen, Washington, D. C.: It is unfortunate that we have to rely absolutely on the clinical aspects for the diagnosis of trachoma, and it is hoped that the cause of this disease will soon be discovered. The medical officers of the United States Public Health Service see, among immigrants, a large number of cases in all stages of the disease with its various sequelae. An immigrant may be deported within three years after his arrival, instead of two as has been stated, if found to be suffering from trachoma. I have seen Dr. Fox do his grattage in one case and, while of course grattage is not new, he apparently performs a very radical operation. I have no knowledge of this radical treatment except what Dr. Fox tells me. I do not wish to convey the idea that I believe trachoma to be incurable, but I know of no treatment, medical or surgical, which will surely give a quick cure in this disease. There are many thousands of trachomatous aliens in Europe and it would not be practicable to permit them to come to this country and be cured here. I agree that trachoma is a dangerous, communicable disease and it should be reported. Several thousand immigrants arrive daily at Ellis Island and the doctor on line inspection passes only those eyes which are plainly normal. He does not attempt to make a diagnosis, but puts aside any immigrant presenting any abnormal appearance of the eyes and the case is carefully examined in a room reserved for this purpose. If the case is at all suspicious of trachoma or a conjunctivitis of any degree is present, it is sent to the hospital and given observation care and treatment for days or perhaps weeks. The diagnosis of trachoma in an immigrant is made only after observation and treatment in the hospital. Any case of conjunctivitis that can be cured in a few days or weeks is not certified as trachoma.

Dr. J. W. Kerr, Washington, D. C.: At the last meeting of the American Medical Association a resolution was adopted calling on the Public Health Service for an investigation of trachoma in the United States. It should include a determination of the prevalence of the disease among ninety millions of people, but for the present this can be done only here and there. The passing of such a resolution is an evidence of the shortcomings of our system of reporting morbidity, which will have to be improved as one of the first steps to be taken in meeting the trachoma problem. We must have uniform state laws, because the government cannot force the states to report diseases. Nevertheless, in accordance with the resolution mentioned and also instructions from Congress, we have undertaken to make studies of the prevalance of trachoma. You are already familiar with the Indian investigations. In addition, we have examined several thousand schoolchildren in California, and over fifty-two thousand people in Minnesota within the last year. Approximately, forty-eight thousand of this latter number were persons other than Indians, and Dr. Clark found only seventy-seven cases of trachoma among them. This total number includes about thirteen hundred miners in St. Louis and Itasca counties, and the undue prevalence of trachoma among them brought up the general percentage for the state. This is mentioned especially to emphasize the fact that we are probably not facing an epidemic. We probably have about as much trachoma now as we have had for a score of years, only we did not know of its prevalence then. The responsibility for the reporting and care of trachoma cases rests with the states, with the assistance of the government. Not only official agencies must be utilized, but private agencies and the great body of the medical profession. We have found difficulty in making inspections in two large cities in this country. In one we were refused the opportunity to examine the schoolchildren, and in the other requests for the making of such examinations were ignored. If we are to ascertain conditions we must have the aid of state and local public health officials, which we now have, and we must have the aid of the medical profession and the boards of education. Dr. Lewis spoke of there being 2 per cent. of trachoma among the Indians of New York. Our results showed that it was 0.2 per cent among 943 Indians examined. Referring to Dr. Wiener's request for information as to the experience of our officers with trachoma, I think the discussion he heard in Oklahoma related to officers of the Indian Service. We heard the same criticism of the officers of that service. The disease, however, is highly prevalent there. We sent one of our most experienced officers to Oklahoma, one who had been at the Ellis Island Hospital for over six years and who has seen much trachoma. We did not send an officer into the field who had not had years of experience in trachoma, with the possible exception of one, who had had experience but had been out of the work for a while. He was sent to a state where there were practically no Indians present. The officer who reported on this work in Minnesota has been engaged in trachoma work for over ten years. Similarly, those sent to the Dakotas, Washington, California and other states had long experience. Our officers do not pay special attention to other diseases of the eye, to which you devote your lives, but they do know trachoma.

Dr. J. A. Stucky, Lexington, Ky.: I am sure that trachoma is curable. I hope that when we establish a clinic in the mountains of Kentucky, Dr. Fox will come down and stay a week or two and show us the grattage procedure, and then tell us what to do with the sequelae of the disease. I reported these conditions to the Kentucky State Board of Health two years ago, but to no purpose. The State Board of Health has a mere pittance of money. The state of Kentucky is wealthy in everything but money. We are over two and a half million dollars in debt. The State Board two years ago appropriated $100 for this work, which would pay part of the expense of one of my trips. It has not been paid yet. Some one said, "Why don't you go to the legislature?" I asked for that privilege, and I was told by the "powers that be" that it would defeat the efforts then being made toward getting more money for the State Board of Health. We appealed to the government and it answered promptly. Shall we appeal to the masses? My own state pride rebels at the idea of asking other states to help us, but if we can not do it ourselves that is all there remains for us to do. It is up to the medical profession to assist in educating the people who are blessed with more than their share of this world's goods to help save the last remnant of the real American, the people who came with Daniel Boone over these mountains a century ago.

TEMPERATURE OF THE CONJUNCTIVA

LUCIEN HOWE, M.D.
BUFFALO, N. Y.

I. EARLIER METHODS OF MEASUREMENT

Other students, appreciating the probable importance of this subject, have attempted similar measurements, but all of them were made with some modification of the mercurial thermometer. One form of this which attracted considerable attention was suggested by Galezowski. It had a flat bulb small enough to pass easily beneath the lid, and the tube extended 8 or 10 cm. at right angles to the bulb; but the glass of the bulb was so thin that the least pressure of the lid produced a rise of the mercury, and of course constant readings were impossible.

II. THE THERMO-COUPLE

The thermo-couple is also called the "thermo-electric junction," or "thermal junction."

If two strips of metal of unequal conducting power are soldered together, the line where they meet is of course a "junction." If the free ends of these two strips are connected, and then if the line of their first junction is heated or cooled, that junction becomes a "thermo-couple," or thermo-electric junction. An electric current is then generated throughout the circuit, and if a galvanometer be placed in that circuit the strength of the current will be indicated by the index.

Or again, we may arrange two such couples in the circuit, placing the couples so that they are technically in "multiple" or "parallel," having the galvanometer in series with one of the connections. Such an arrangement is sketched in Figure 1. Then if both couples are heated or cooled to the same degree at the same time, the electric current developed by each couple neutralizes, as it were, the current which is developed in the other and no change is registered by the galvanometer.

If one of these couples, however, is heated or cooled more than the other, the excess of electric current developed will be shown by the index of the galvanometer. This arrangement of two thermo-couples has been used for some years in laboratories and certain industrial establishments for measuring slight differences of temperature between two mediums.

When my attention was first called to the great sensitiveness of this arrangement, it seemed rather odd that no ophthalmologist had used it to measure the temperature of the eye. The reason, however, soon became evident; for though the principle was well known and simple enough, its application was by no means easy.

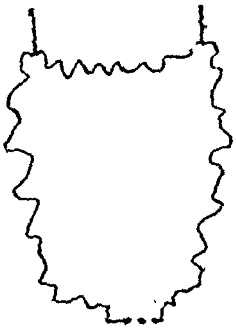

Fig. 1.—General plan of the arrangement of two thermo-couples with a galvanometer in circuit.

These difficulties, however, have apparently been overcome, and the following is the general plan of the two thermo-couples which have proved most useful for measuring the temperature of the conjunctiva as compared with that of the mouth:

1. A very fine covered copper wire extends about 8 or 10 feet from one post of a galvanometer.

2. The free end of this copper wire is fused to one end of a composition wire, which is particularly useful for delicate thermo-couples. Several kinds of such wire are on the market. The one which I used is known as Ideal No. 32. The point of fusion of these two delicate wires forms the first of the two thermo-couples.

3. The other end of this Ideal wire is fused with a second piece of copper wire. This junction forms the second thermo-couple.

4. The other end of this copper wire extends about 8 or 10 feet to the second post of the galvanometer.

Theoretically these two couples would be sufficient to indicate on a suitable galvanometer any difference of temperature between them. But practically we know that:

A. The junction of the copper, and of the composition wire must be secure.

B. The two wires must be thoroughly insulated, and not easily injured.

C. They must be so protected as to be easily and thoroughly disinfected.

D. They must "balance" exactly. That is, neither should produce any current in excess of its fellow, when both couples are at the same temperature.

It is desirable, therefore, to glance at the special forms of the thermo-couples which, after numerous trials, have been found most suited for introduction into the conjunctival sac and into the mouth, respectively.

A. The couple for the conjunctiva. This is seen, natural size, in Figure 2. In making records it is convenient to designate this one as "Couple A," and to attach its wire to the post of the galvanometer which corresponds to black numbers on the scale.

B. The couple for the mouth. This is seen, natural size, in Figure 3. In making records it is convenient to designate this one as "Couple B," and to attach its wire to the post of the galvanometer which corresponds to red numbers on the scale.

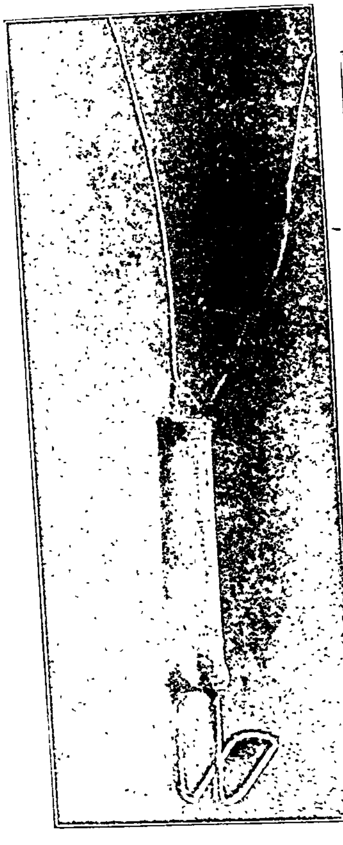

Fig. 2.

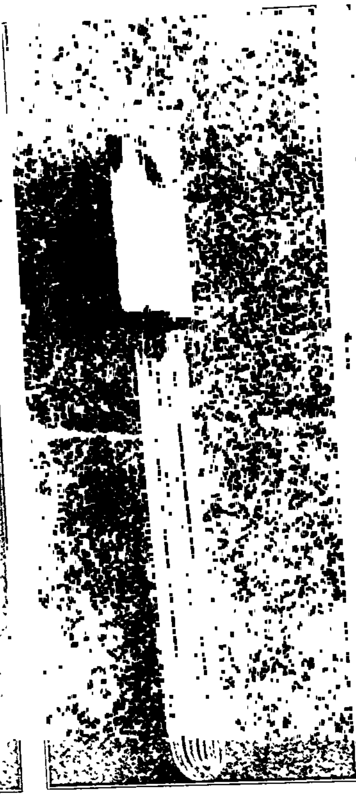

Fig. 3.

Fig. 2.—Thermo-couple for conjunctival sac (actual size). Fig. 3.—Thermo-couple for mouth (actual size).

III. THE GALVANOMETER

Although any variety may be used, the galvanometer found most convenient for this purpose was the D'Arsonval, Type P, mounted on a tripod. This is seen in Figure 4. Descriptions of the D'Arsonval galvanometer can be found in any treatise on magnetism. Any unequal heating or cooling of the two couples produces a current which causes a suspended mirror to turn from side to side. This mirror with its suspension is seen enlarged in Figure 5. The mirror is viewed through a telescope, and reflects the figures of a scale. This scale on the horizontal strip is 50 cm. long, graduated in millimeters, and numbered 25 red to 0 to 25 black. As this scale is on the side of the strip facing the galvanometer, of course it is not visible in Figure 4.

IV. SENSITIVENESS OF THE THERMO-COUPLE

According to measurements made at the factory in Philadelphia with my couples, 1 mm. of the scale corresponds to about six hundredths of one degree Centigrade (0.06 C). Practically the same results were found here. Now it is not difficult for an observer to distinguish a movement of the index of a half or even a quarter of a millimeter. That is to say, the couples arranged in this way show a difference of temperature of 0.03°C. or even 0.015°C. This is the sensitiveness expressed in figures.

An illustration shows better what that means. If the hand is placed 3 or 4 inches from one of these couples, the radiated heat is sufficient to make a very distinct movement of the index of the galvanometer. If the finger touches one couple the index at once swings over 30, 40 or even more millimeters. Or if one couple is held in the hand and gently breathed on, the index flies rapidly not only to the end of the scale, but so far beyond as to make any reading impossible. In other words, we have here a method of measurement far more sensitive than by any thermometer which could possibly be used.

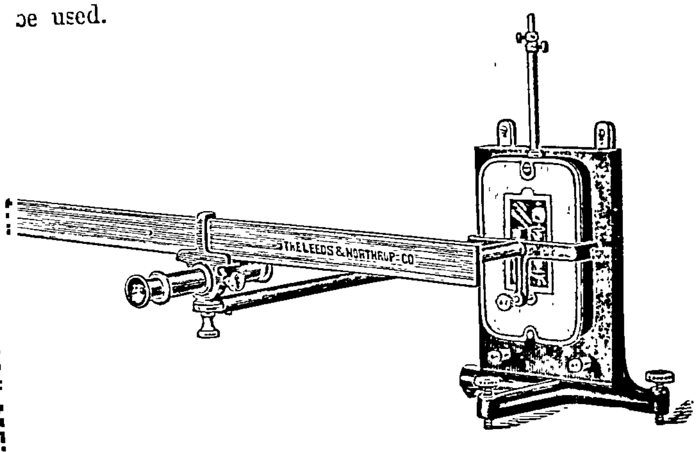

Fig. 4.—D'Arsonval galvanometer for registering variations of temperature.

V. METHOD OF MAKING THE MEASUREMENTS CLINICALLY

As a preliminary we must make sure that the two couples "balance" each other; in other words, that the galvanometer registers zero when the two couples are in some medium — air or water — in which their temperatures are exactly the same. It is also essential to know how many seconds or minutes are necessary for such a balancing to take place, as this depends largely on the relative thickness of the glass which insulates each thermo-couple, and somewhat on the distance which each is covered. Let us suppose that with a given pair of couples we have ascertained that such a balancing takes place after two minutes and a quarter. Also suppose that we have applied a 5 per cent. solution of cocain two or three times to the conjunctiva to be examined. The patient being then seated comfortably and conveniently near to the galvanometer, Couple B is placed in his mouth. He is asked to close his lips on it, and allow the glass tube to rest against the side of the tongue, as is done when we use a clinical thermometer. This couple must of course first remain in that position for at least the two minutes and a half which had been found necessary by previous experiment to bring it up to the body temperature. Having done this, the surgeon takes Couple A with the thumb and index-finger of the right hand, as indicated in Figure 6, the lid is raised, and the couple introduced gently beneath the lid.

Care should be taken to have the portion which is beneath the lid actually in contact with the globe. If the point is bent forward so as to cause the lid to project and produce an air space between the lid and globe even a few millimeters wide, the effect is seen at once.

While the two couples are thus held in position by the surgeon, an assistant looks through the telescope of the galvanometer to observe the changes in the index, and to record them as they occur. At first the index may show that the mouth registers as much as 1 or 2 degrees above the temperature of the eye. But if care is taken to have the patient keep Couple B gently but constantly against the tongue, and if the operator is equally careful to rest Couple A against the eye, after from three to four or five minutes the temperature becomes gradually more equalized, until, under normal conditions, Couple A, in the culdesac near the inner or outer canthus of the eye, registers from 0.2 to 0.3° C. lower temperature than that of the mouth.

VI. GRAPHIC REPRESENTATIONS OF VARIATIONS IN TEMPERATURE

This can be shown on a system of coordinates in which the zero line represents a perfect balance between the two couples, A and B, no matter what the absolute temperature may be. Each division of the abscissa (the vertical line) below the horizontal zero line shows that the index on the scale of the galvanometer has moved 2 mm. toward the black side—in other words, that the temperature of Couple A (the one used for the eye) is 0.12 degree Centigrade warmer than Couple B.

On the other hand, each division of the vertical line above the horizontal zero line shows that the index of the galvanometer has moved 2 mm. toward the red side of the scale—in other words, that Couple B (in the mouth) is 0.12 degree warmer than Couple A.

Each division of the horizontal lines represents one-fifth of a minute. Such a graphic representation of the variation of temperature in one observation is shown in Figure 7.

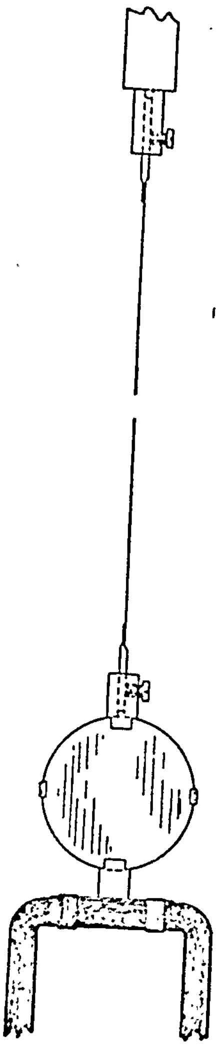

Fig. 5.—Mirror of the D'Arsonval galvanometer, showing its upper suspension, and attachment below to a coil of fine wire.

VII. RESULTS OF THESE MEASUREMENTS

After this necessarily detailed description of the construction and method of using these thermo-couples, the question naturally arises, What do we learn from them? The results may be briefly stated as follows:

1. We know now and for the first time that the temperature of the culdesac of the conjunctiva near the outer or inner canthus is usually from about 0.3 to 0.4 degree C. lower than that of the mouth. This finding was at first rather surprising, and was naturally attributed to some fault in the instrument or in manipulation. Repeated trials, however, on different individuals seem to establish the fact beyond question. The reason of this is probably that the couple placed in the mouth rests against the tongue, and is protected by that on one side, and the thick layer of facial muscles on the other. On the other hand, the globe of the eye is protected only by the lids, much thinner of course than the cheek, and therefore not only colder, but more sensitive to variations of external temperature.

2. The temperature of the conjunctiva immediately over the cornea in six individuals was found to be on the average 0.1 degree C. lower than at the outer or inner canthus.

It will be observed that 36.9 C., or about 98.6 F., can be considered as the normal temperature. In several of the measurements the patients held in the mouth not only Couple B but also a Centigrade thermometer graduated in fifths of a degree, and accurately corrected by the Bureau of Standards. This gave the absolute temperature of the mouth, from which by comparison it was possible to obtain the absolute temperature of the conjunctiva. In these measurements also care was taken that no cold or warm fluids or food had been taken into the mouth for some time previously, as such substances affect the temperature for minutes or even for a few hours.

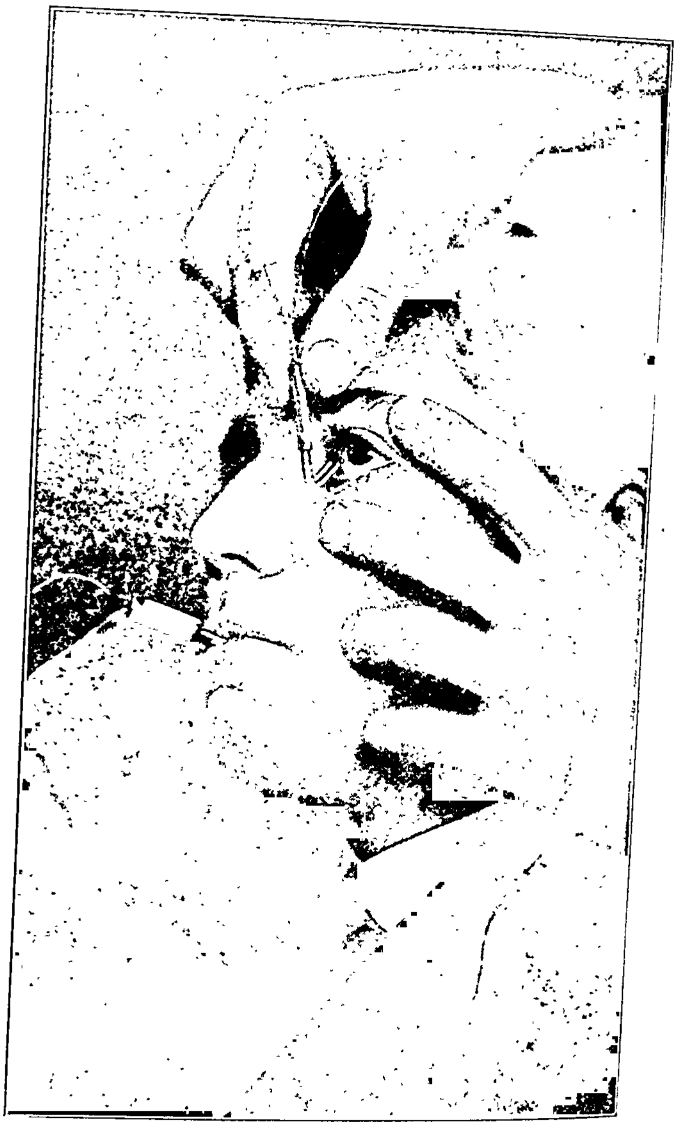

Fig. 6.—Method of using the two thermo-couples.

3. It is possible by this method to measure for the first time to what extent cold or hot applications to the outer portions of the lids really change the temperature of the conjunctiva. It was found, for example, in one case that when pieces of cotton moistened with ice-water were applied to the lids in rapid succession four or five min-

utes, the temperature of the conjunctiva could easily be reduced 1 or about 1.5 degrees Centigrade.

On the other hand, the difficulty in reducing the temperature below that increased rapidly with each fraction of a degree.

This point is of importance in connection with the treatment of bacterial infections. It is well known that many of the forms which invade the conjunctiva have their vitality lessened in proportion to the decrease in temperature. Practically, however, it is difficult or impossible to produce such a change in the temperature as prevents the growth of these bacteria in the test-tube. This is a phase of the subject which seems worthy of much more careful study concerning each separate germ.

4. It is probable that the thermo-couples here described will prove of some value in at least two other directions. These are:

A. Indicating changes of temperature which accompany certain inflammatory conditions of the cornea, uvea or other portions of the globe itself.

B. Inasmuch as efforts of accommodation and convergence are often followed by slight injection of the conjunctiva, it is quite possible that with these two couples we may be able later to obtain a better idea of the metabolic changes which take place in that complicated process which we call eye-strain.

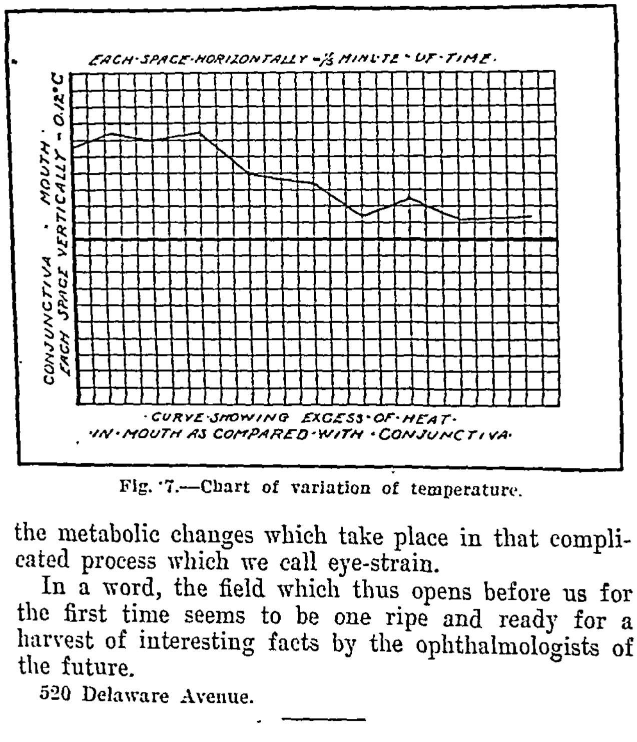

Fig. 7.—Chart of variation of temperature.

In a word, the field which thus opens before us for the first time seems to be one ripe and ready for a harvest of interesting facts by the ophthalmologists of the future.

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ABSTRACT OF DISCUSSION

DR. EDWARD JACKSON, Denver: A paper of this kind suggests to me certain possible applications; and also a question or two which may be of practical importance. It is impossible that such an apparatus should come into clinical use until it has been worked out into a somewhat permanent form. It should be standardized so that it can be managed by different men, eliminating any serious personal equation, so that the results will be fairly constant. Then a considerable amount of laboratory work would have to be done with it to determine facts to be observed in connection with disease. Dr. Howe has mentioned the point that first suggests itself in the therapeutic application. In the reduction of the temperature of the eye it seems likely that our therapeutic measures cannot be extended greatly. But with some accurate means of determining what we accomplish by it, heat could be used considerably more freely, and more effectively than it has ever been used. It was pointed out a great many years ago that the eye tolerates very high temperatures on the surface. *Dr. Lippincott of Pittsburgh* recommended for corneal ulcers raising water to the boiling point and dropping it as quickly as possible on the ulcer. So if we knew just what we were doing, and what could be done, heat could be applied more effectively than ever before in ocular therapeutics. The question arises as to whether the mouth is the best point of comparison. In the beginning it may be well to compare the temperature of the eye with that of the mouth. I can see the value of experiments continued along that line, but it seems to me that when it comes to be applied as a clinical method it would be better to compare the temperature of the two eyes? What reason is there for thinking that that would not be a better line of investigation?

DR. MELVILLE BLACK, Denver: There are two or three practical points in connection with this demonstration, and one is, I think, in regard to how long it is necessary to make an application of heat or cold to either raise or lower the temperature of the part and have it maintained. For instance, we have been in the habit of making hot applications for about five minutes. We believe that after that time the hot applications cease to be of benefit and are detrimental. This procedure ought to explain why. It may be that after the application of heat continuously, for a certain period of time, we would find, by this apparatus, that it does not change the temperature of the conjunctival sac, and that possibly is also true with regard to cold. We know that we can apply cold for a considerable time without detriment and it would be interesting to know what thermal changes there are in the sac after one or two minutes. Will Dr. Howe explain more fully how he made the eyes cold? He speaks of making ice applications. There are many different ways of making ice applications. Has he used the ice-bag with pulverized ice, or ice pledgets of gauze changed every half-minute, and if so how much reduction of temperature was occasioned by this? In Dr. Howe's paper I have failed to get satisfactory answers to these questions.

DR. ALLEN GREENWOOD, Boston: I wish to call the attention of the members to the experiments of McGillivray of Scotland, who, though not using a delicate instrument like this, tested the temperature of the conjunctiva and cornea and found that they were several degrees Fahrenheit lower than the ordinary temperature. With the lids closed the temperature was raised one or two degrees and with the lids open was lowered the same amount. From this, and from the fact that bacteria grow slowly when the temperature is reduced, he worked out a theory of testing corneal conditions by such means as allowed the patient to keep the eyes open most of the time, and he proved conclusively to himself that the lowering of the temperature brought about by the exposure of the cornea to the air inhibited the growth of germs in ulcer of the cornea. This is along the line of what Dr. Howe has been doing so skilfully and scientifically.

DR. MARK J. SCHOENBERG, New York: There is a possible source of error in the fact that Dr. Howe has used 5 per cent. cocain in the conjunctiva, which is *vasoconstrictor*, and this might reduce the local temperature. He found the temperature about 0.4 degree lower on the conjunctiva than in the mouth. If Dr. Howe had used a solution of cocain in the mouth at the same time he used it in the eye, then the control, in my mind, would have been better. I would suggest the use of holocain, which has no vasoconstrictor action. By studying the intra-ocular temperature of normal animals and in eyes which have been subjected to various injuries and pathologic conditions, something could be learned of the temperature of the interior of the eye in certain pathologic conditions. Dr. Jackson justly called attention to the point that the temperature should be compared in both eyes at the same time. In tuberculosis of the lung it is found that the temperature of the axilla is higher on the diseased side. Even the temperature of the skin has been measured by special thermometers and has been shown to be a little higher on the side of the tuberculous lung. The same thing could be made out with the temperature of the conjunctiva, measured in both eyes, as to whether pathologic changes were going on in one eye.

Dr. William H. Wilder, Chicago: We are all acquainted with the clinical fact that hot applications help certain deep-seated inflammations of the eyeball. The supposition is that with the Bier treatment we actually raise the temperature of the part to which the heat is applied, thereby quickening the circulation and bringing fresh blood and antibodies to combat the infectious elements. It would be an extremely interesting practical point to know if we are using hot applications in a way to increase the temperature so as to produce increased circulation through the deeper structures of the eye. I believe these experiments may be able to elucidate some of these points.

Dr. George H. Price, Nashville: It is a well-known fact that all the surfaces of the body and internal structures differ in temperature; the eye, ear and nose show variations. Dr. Howe's ingenious instrument is for measuring the normal temperature of the conjunctiva and for detecting variations due to disease. Living substances will stand very high and very low temperatures. A fish may be frozen up in ice, thawed out, and live, but boiling kills it. Cold only retards inflammatory processes due to germs. If we reduce the temperature until the germ is killed, the tissue is also killed. Sufficient heat will destroy any germ which produces coagulation. Cold retards germ production, but heat encourages it up to a certain point, beyond which it stops it. By this instrument we may be able to fix the limits for best results in treatment. If reproduction of the germ about the eye can be held in abeyance the disease will be checked. In so-called non-infectious conditions of the eye it might do some good, giving us an indication as to the temperatures best suited for combating such conditions.

Dr. Lucien Howe, Buffalo: In this first paper it has only been possible to present a description of the apparatus and give a few suggestions as to its application. But the problems which have been suggested here, and one or two others which might be worked out with these thermo-couples, have been already considered and some of the preliminary work has been commenced. It may be one or two years before it is safe to formulate any definite conclusions. For example, the temperature of the interior of the globe has been measured in two cases in which a practically normal eye was about to be enucleated on account of malignant growths in the orbit. These measurements seem to show that the temperature of the interior of the globe is a little higher than that of the conjunctiva and lower than that of the mouth. It may also be stated that measurements have been made of the degree to which it is possible to lower the temperature of the conjunctiva by applying ice in a certain way or how the temperature can be raised by applying heat. This last is apparently of great importance with regard to the life of the Neisser gonococcus, because that germ can be killed, at least in the test-tube, by a temperature only slightly above the normal temperature of the conjunctiva. Now, for the first time, we can measure just what temperature is produced by this or that method and thus we can control our treatment intelligently.

BLEPHAROCHALASIS

REPORT OF TWO CASES WITH THE MICROSCOPIC EXAMINATION *

WALTER BAER WEIDLER, M.D.
NEW YORK CITY

Blepharochalasis is the name suggested by Fuchs in 1896 for that condition affecting the skin and the subcutaneous connective tissue of the lids, with atrophy.

This condition has been reported repeatedly since then, but still must be considered as a comparatively rare affection and up to the present I have not been able to find any cases reported except those of the foreign clinics. The disease is not a new condition, as McKenzie[1] as early as 1854 called attention to a disease of the lids which he thought was a ptosis with hypertrophy following edema, and which was later followed by a relaxation and drooping of the skin of the lids. In nearly every instance in which the affection has been reported it has been given a new name by the individual who reported the case, and this has been most unfortunate, as it has only added confusion in our study of the disease. Perhaps if there was a clearer understanding of the etiology and the pathology of the cases seen and reported there would not be all this difference of opinion as to its proper nomenclature.

It seems wise to classify it with the dystrophies of the skin and Fuchs has included in this class ptosis adiposa and elephantiasis. Von Ammon spoke of this condition of the lids and called it epiblepharon, ptosis adiposa or ptosis atonica. The latter name fairly well describes the condition of the lids in the later stage of the disease.

Sichel[2] in describing a case enumerated nearly all of the symptoms, but he regarded it as a true ptosis of the lids, which as we now know, from our further observations, is not the case. Arlt,[3] reporting his case, called attention to the rosy appearance of the skin, but apparently overlooked the marked thinning and atrophy. Schwalbe was the first to use the term "blepharochalasis," but he used it to describe the results of his operation on the lids of patients who had shrinking and atrophy of the conjunctiva and the subcutaneous connective tissues of the lids after trachoma. His operation was designed to bring about a relaxation of these tissues and he called the procedure by the name just mentioned.

Many other names have been suggested from time to time by the different authors and some of these will be only mentioned; the wisdom of their selection will be left to the reader. Panas called it "ptosis cutanea"; Terson, "dermatolysis palpébrale," which was the name suggested by Dr. Crary, who examined my first case for me. Frankel designated it as "paupières en besace," Dutoit "pseudoleukemia lymphatica," and Rohmer, who has reported four cases, thinks that "angiomégalie des paupières" best describes the condition.

"Blepharochalasis" is the best name that has been suggested. Rejecting the idea of ptosis and admitting the existence of edema, with sometimes a consequent stretching, thinning and atony of the skin and subcutaneous tissues of the lids, this term includes all of the most important changes.

In regard to the etiology of this disease, nationality does not seem to be a factor, although in all of the cases that have been reported so far, except my second case, the patients have been of foreign birth. This condition has not been reported as occurring in the colored race, except in Shoemaker's case, which was not reported as blepharochalasis, and therefore must be considered only as being possibly of such origin. With the exception, perhaps, of three, all of the cases of the blepharochalasis reported have been in girls. The youngest patient on record was 8 years of age and the average age 10 to 14. It seems to bear some relation to the beginning of menstruation and, from study of the records of the cases so far reported, I find that nearly all of them began at or near the time of the

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* Because of lack of space, this article is abbreviated in The Journal. The complete article appears in the Transactions of the Section and in the author's reprints.

[1] MacKenzie: Practical Treatise on the Diseases of the Eye; Ed. 4, London, 1854, p. 187.

[2] Sichel: Ann. d'ocul., 1844, xii, 188.

[3] Arlt: Handbuch für Augenheilkunde (Graefe-Saemisch), iii, 454.

first period. In my second case reported in this paper there was a history of severe sunburn having preceded the appearance of the trouble, but I do not think that it had anything to do with the appearance of the trouble.

There are several cases in which the lesion appeared after severe physical exertion (Fuchs), but this in itself would not seem to be sufficient to explain all of the signs and symptoms of the disease. His case was that of a man who noticed the curious swelling of the lids after blowing a horn. A history of a profound mental shock or fright has preceded the appearance of the swelling, and in some of the cases it has been first noted after a long spell of crying. This all emphasizes the importance of carefully considering the emotional and psychic origin of this disease.

Recurrent attacks of angioneurotic edema have been given by Fuchs[4] and Rohmer as the cause. This seems quite a possible explanation for some of the cases, considering the age of the majority of those reported, together with the sex and history of repeated attacks of the edema and the consequent deformity.

Errors of refraction have not been considered of much or any importance as a cause, and in neither of my cases were they of such a nature as to make me regard them as a possible factor. Schmidt-Rimpler[5] thinks that it can best be explained by a hernia of the orbital fat. It has been suggested that it is directly due to changes in the vascular and lymphatic systems. But there has never been found in any of the cases any special involvement of the general lymphatic system. The change noted in the vessels has been an increase in size but no increase in the number of vessels in the part affected.

As far as my own observation has gone it appears that blepharochalasis begins with an edema of the subcutaneous connective tissues of the upper lid between the skin of the lid and the tarsal plate; the presence of this edema affecting, after a time, the elasticity of the tissues involved, with a consequent atrophy of the skin and subcutaneous tissues of the lid. I would like to call attention again to the importance of the time of life at which it appears and its close association with the beginning of menstruation, which I believe is a causal factor. Just why it affects the upper lid and remains confined to that portion of the orbital tissues I am unable to explain. There may be found in our further studies of this disease that autointoxication plays some part in the etiology of some of the cases of blepharochalasis. Inheritance has not been of great importance in the causation of this condition. In only two of the cases reported is there an indefinite history of the same condition having existed in one of the parents.

The microscopic examination of the tissues removed from the right lid of my second patient was of sufficient interest to report in detail.

Skin section was stained with hematoxylin and eosin after hardening of the tissue in the usual manner. The epidermal layer of cells was of normal thickness and there were no special changes noted in any of the different layers. This section of skin was compared with a piece of skin that had been removed from a normal eyelid, and the changes in the rete malpighii that have been spoken of by several observers were not found. There was a slight round-cell invasion noted in some portion of the corium and a widening of the spaces in the subcutaneous tissue of the corium. This widening and stretching of this portion of the corium was probably the cause of the blepharochalasis, or it may also have been the result of this disease. This condition of the corium gives the appearance of edema as described in these cases, but it does not show any fat formation in this portion of the lid. Special staining by the Weigert method for elastic fibers did not show any increase of this special tissue in the section. Some have asserted that the elastic tissue is increased and that there is an increase in the blood-vessels and lymphatics, but neither of these changes was found in my sections. Sections of the subcellular connective tissue showed the blood-vessels well filled with corpuscles and dilated; but no increase in the number of vessels and nothing of any importance was found, except the dilatation of the subcellular spaces.

The fatty mass which was removed from the under part of the superior portion of the orbit seemed to be enclosed in a capsule and had all the appearance of a fatty tumor which shows a great increase of blood-vessels all filled with blood. A considerable number of fat-cells and stroma with a well-marked connective tissue stroma made up the main part of the tumor. The decided increase of the blood-vessels in this tissue suggests that it was not the normal orbital fat.

The lacrimal glands which were removed from both sides were examined and the glandular portion was found to be healthy, and at places the capsule was seen. There was no special engorgement of the vessels, but there were several areas showing some round-cell invasion. This, however, was not marked and may have been due to the inflammatory reaction in this portion of the orbit. These areas of round cells consisted of leukocytes and were in the immediate vicinity of the blood-vessels.

It may be well to say that I removed the skin and the subcutaneous connective tissue separately, which of course is to be regretted as it was not possible to study the relation as closely as I had desired. The lacrimal gland was removed separately from the fatty mass which seemed to come from the superior wall of the orbit and behind the septum orbitale.

There has been considerable opportunity afforded for anatomic and pathologic investigation of this disease. Most of the patients have had one form or another of operation for removal of the affected tissues of the lid, thus permitting microscopic examination of the specimens obtained. It has not given us much information, however, because the findings have been so widely different in many of the reports. In most of the observations there has been an atrophy of the different layers of the skin, but more especially the rete Malpighii, the presence of fatty tissues, an increase in the size of the vessels, with a stretching and widening of the meshes of the connective tissue, is all that has been noted. No one seems to have given any explanation for the edema or the infiltrate which is found in the meshes of the subcutaneous connective tissue of the lids. It looked very much like a fatty infiltrate in my case and Bach[6] found, when operating on his patient, that there was what looked like a fatty tumor which seemed to come from beneath the upper orbital wall.

Fehr[7] describes very minutely what he found as far as the excised skin is concerned. He hardened the tissue in formaldehyd solution and stained it in various ways and at the same time treated some normal skin in like manner. The excised skin showed atrophy of all of the layers, but in the rete Malpighii layer he found almost complete destruction. The subcutaneous tissue was very lax and friable. The skin and the subcutaneous tissue were rich in blood-vessels, which were dilated and filled with normal blood-cells. In places there were pigment deposits which were probably due to the blood.

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[4] Fuchs: Ueber Blepharochalasis, Wien. klin. Wchnschr., Feb. 13, 1896, p. 109.

[5] Schmidt-Rimpler: Centralbl. f. prakt. Augenh., 1899, xxiii, 297.

[6] Bach: Arch. f. Augenh., liv, 73.

[7] Fehr: Centralbl. f. prakt. Augenh., 1898, xxii, 74.

Part of the sections were stained dark-blue with orcein for elastic fibers, according to the Unna-Tanzer method, and the remainder of the tissue decolorized to a grayish red. The elastic fibers were still present in great numbers but much thinned and stretched, forming wider meshes than normal. The thick masses of elastic fibers found normally at the junction of the skin and the subcutaneous tissues were entirely absent. Schmidt-Rimpler says that he was not able to find anything characteristic in any of his examinations.

Rohmer[8] was able to examine the flaps removed from two of his patients. In Case 2 he found dilatation of the lymphatics and new-formed vessels, large sections of vessels (arteries and veins) engorged with blood in the skin and subcutaneous tissues. Not so much the number of the vessels as the caliber showed increase. There was a general thinning of the skin, but no study of the elastic fibers was made. In Case 3 the elastic fibers were carefully studied (Unna-Tanzer) and no changes were discernible. Inflammatory features appeared due to the cicatrix from a former operation five weeks previously. Arteries and veins were much increased in size but no changes were noted in the lymphatics. In closing he says that none of his studies has enabled him to form any conclusions that will throw light on the subject. Rosenstein[9] has demonstrated some microscopic preparations with marked atrophy of the elastic fibers, showing, besides a flattening of the epidermis and a tearing apart of the subcutaneous connective tissue masses, dilated veins and thinned walls. This dilatation of the subcutaneous connective tissue was noted by Fehr also and it is this portion of the lids which I think is the first to be involved in the disease. Whether this dilatation of the subcutaneous connective tissue is an edema or due to an invasion of fat is a question that, if once decided, will help a great deal toward clearing up the etiology of this disease.

There is no trouble in making a diagnosis of this condition after one has seen a case of blepharochalasis. In most of the cases reported it has occurred in young girls and is always limited to the upper lids; and it never gets well if left to itself, which is not the rule in angioneurotic edema. There are never any subjective symptoms, such as pain, heat or tenderness. It has been confounded with ptosis adiposa, but this should not occur if we remember that the latter disease is nearly always seen in the old, rarely or never in the young, and that it involves all of the lids, upper and lower, and is generally seen toward the inner half of lids. Many of the cases of "ptosis adiposa" reported have really been cases of this disease and Wooton has reported two cases of "ptosis adiposa" in young girls, on whom he has operated with good results. He now thinks they should have been diagnosed as blepharochalasis.

Shoemaker[10] reported a case of "bilateral enlargement of the lacrimal gland;" from the pictures of the case and the history, it would seem that this might also have been a case of blepharochalasis

Abstract of Case Report.—Miss M. G., colored, aged 19. At the age of 14, both upper lids became swollen, swelling more marked to the outer side of lids, ptosis of lacrimal glands, no change in the parotid or salivary glands, anemia present, no syphilis or tuberculosis. Condition not changed by treatment.

Lambert[11] presented a case report of hypertrophy of the lacrimal glands, which may have been from the history and the microscopic findings, also a case of blepharochalasis.

Abstract of Case Report.—Miss X., aged 19. Condition appeared at the age of 13 with swelling of both of the upper lids, gradually increasing. Palpation revealed a tumor, which increased in size when patient leaned her head forward. Right side was larger than left. (This was true in both of my cases.)

Dr. Dixon's microscopic study revealed lacrimal gland and orbital fat. "Nothing observed as pointing to malignancy; therefore the diagnosis of hypertrophy of glands stands."

Hirshberg[12] reports a case of mumps der Thranendrüsen which has points in common with blepharochalasis.

Abstract of Case Report.—A girl of 15; swelling and redness of the upper lids; lacrimal glands palpable. Condition about the same over a period of years, in spite of treatment.

There are a number of conditions affecting the lids for which this disease might be mistaken.

Ptosis adiposa, as has already been said, presents some of the symptoms of blepharochalasis. There is a relaxation of the skin, but no true atrophy follows the condition no matter how long it may have existed. In ptosis adiposa the bagging of the upper lid is more marked at the inner side, and this condition is thought to be due to the relaxation of the bands of fascia connecting the skin with the tendons of the levator with the upper margin of the orbit. This condition has been referred to as "tear-bags" in the old.

Elephantiasis of the lids is seen in later life and often gives a history of having appeared after severe inflammation of the lids. It is frequently seen after attacks of erysipelas. In this disease the swelling of the lids may assume tremendous proportions. This swelling is a permanent thing and may hang down over the face. There is in some of the cases involvement of other parts of the body and it may be possible to demonstrate the presence of the *Filaria sanguinis hominis* in the blood. The skin is much denser and firmer than in the cases of blepharochalasis.

Lymphangioma of the lids is usually of the upper lids and in some cases may be limited to one side. The growth in the lids is rather firm and dense and there is often a form of blood dyscrasia which helps in the making of the diagnosis.

Plexiform neurofibroma of the lids is often seen in youth, but it has a rope-like feel to the touch, full of ganglionic nodes, may invade the temple, the lower lids and even extend into the orbit. It is usually unilateral.

Bilateral enlargement of the lacrimal gland simulates this condition very closely and might be easily mistaken for blepharochalasis. There is the slight bagging and sagging of the upper lid to the outer side, but there would not be the general fulness of the subcellular tissues and the thinning of the skin. Hirshberg thinks that bilateral enlargement of the lacrimal gland is not very rare and gives three causes for this enlargement: chronic inflammation following long-standing corneal inflammations; acute inflammation of the gland itself (this is very rare); subacute or nonsuppurative bilateral enlargement possibly due to paralysis of the third nerve.

Mikulicz' disease is quite a different condition and consists in the coincidental enlargement of the salivary and lacrimal glands without pain and is chronic in its course. The disease is probably due to infection from the blood or by way of the ducts of the gland. In some of the cases of this disease there has been local disease affecting the conjunctiva or the cornea or a general disease was present, such as syphilis, tuberculosis, leukemia or menstrual disorders. As a rule it is not seen in the young but comes on in middle life. It might be possible to mistake such tumors as lipomas, adenomas, fibromas, affecting both lids, for blepharochalasis, but the bilateral appearance of such tumors is very rare.

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[8] Rohmer: Arch. d'ophth., 1900, xx, 407.
[9] Rosenstein: Centralbl. f. prakt. Augenh., 1902, xxvi, 233.
[10] Shoemaker: Ann. of Ophth., 1904, xiii, 513.
[11] Lambert: Tr. Am. Ophth. Soc., 1900-1902, p. 403.
[12] Hirshberg: Centralbl. f. prakt. Augenh., 1890, xiv, 77.

CASE 1.—Miss F. V., aged 16, Bohemian. Family and personal history negative; no tendency to edema or swelling of any parts of the body. Usual diseases of childhood.

Present Trouble.—At 14 years of age, when menstruation began, patient first noticed the appearance of slight swelling of the lids. She states that at first the swelling would come and go, and later became permanent. She was treated without any improvement of the condition and came to the Manhattan Eye and Ear Hospital one year after trouble began.

Examination.—Patient was a fairly well-developed girl with a rather pale and anemic-looking skin, but good general health. She came on account of the deformity. There was a bagginess and drooping of the skin and subcellular tissues down over the edges of the palpebral margins. The skin was smooth and there was no tendency to wrinkling or folding, there was a pseudoptosis of the lids. The skin was slightly more pinkish over the area of swelling and the veins seemed to be slightly more prominent. This mass was easily compressible under the fingers and could be moved freely from side to side, giving the suggestion to the fingers of an edema. The lacrimal glands were in place and not enlarged. There was a marked wrinkling of the skin of the brow, from the constant effort on the part of the patient to elevate the lids, which were so much lower than usual on account of the weight of the mass. The lower lids were perfectly normal and the skin absolutely unaffected.

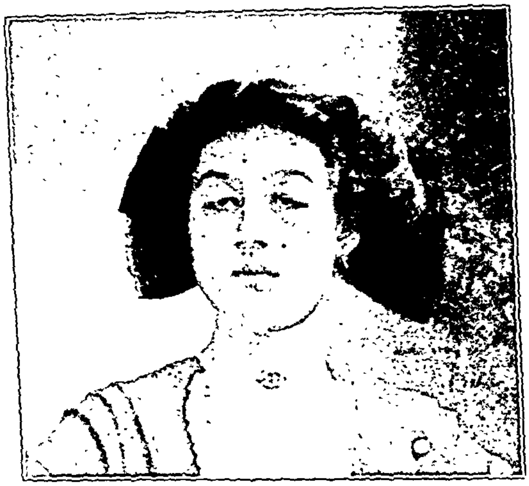

Fig. 1.—Case 1.—Condition after two years. Right side is most pronounced. Seton through the left upper lid.

The Wassermann, von Pirquet and urine were all negative. The blood-count was normal as was also the hemoglobin. Search was made for the *Filaria sanguinis hominis* but without success.

This case was first regarded as one of elephantiasis. It was referred to Dr. Crary who made the following report: "The case is an unusual one and presents some difficulties. I believe the condition to be a form of dermatolysis, although in this condition there is usually a certain amount of hypertrophy of the skin, while in the case under discussion, it seems to me that there is a well-marked atrophy of the skin, associated with the laxity; but the term used is a broad one, and answers fairly well to fix the classification. I feel that the well-developed anemia, apparent from the color of the skin, pointing to a chlorosis, suggests a line of treatment and also suggests a possible neurotic condition, perhaps even a hysterical element."

Treatment and Results.—A seton of white silk thread was introduced into the upper lid of the left eye, entering near the center of the lid and this seton was carried under the skin of the lid and face, emerging on the face near the prominence of the maxilla (Figure 1). It was thought that the presence of the seton might set up irritation and cause absorption. This was allowed to remain for nearly two months without any appreciable change in the lid. Increasing doses of Fowler's solution were given over a period of a month without any effect one way or the other. Blaud's pill and different forms of tonic treatment were given with no benefit. Roentgen ray and the high-frequency current were used for several weeks, but no changes were noted. Local use of collodion and pressure with adhesive-plaster straps and bandages at night did not alter the condition. The faradic current was used and the electric needle was inserted into the swelling; this was continued for two weeks or more but no great reaction followed the use of the needle and no contraction of cicatrix was noted. Patient became discouraged with the failure to get any improvement from the treatment and, as she refused operation, ceased coming to the clinic. On examination one year later the following changes were observed: The rounded swelling of the lids had disappeared and the skin hung down in a series of folds, with great relaxation of the skin and subcellular tissues of the lid. The skin looked much thinner and the surface of the skin showed the crackled cigarette-paper appearance described by Fuchs. The veins were more prominent than when last seen and the apparent ptosis of the lids was still present. It would seem that the lids will remain as they are unless some form of operative means is used to correct the deformity.

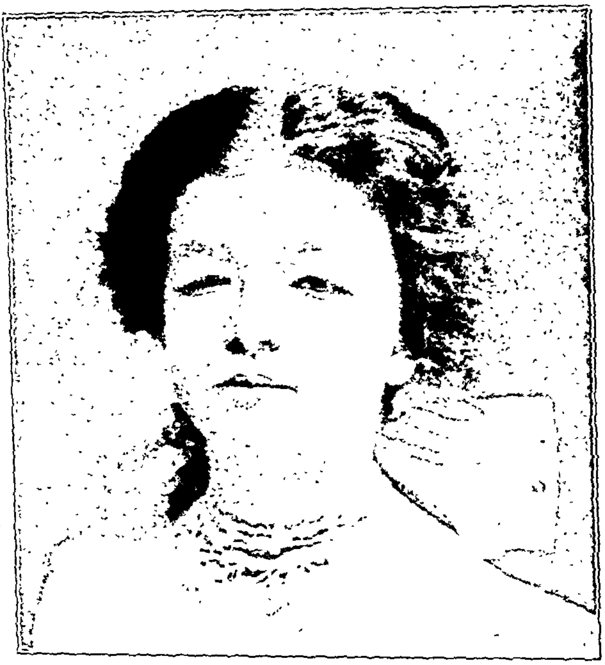

Fig. 2.—Case 2.—Before operation Jan. 30, 1913. Most marked on the right side.

CASE 2.—Miss M. H., aged 14, white, American. Family and personal history negative. No members of the family have ever had angioneurotic edema.

Present Trouble.—Two and a half years ago, following a severe sunburn of the face and arms, patient's mother noticed a slight swelling and puffiness of the lids a few days after the blush of the sunburn had disappeared. The swelling has gradually increased and patient had seen a number of doctors but received no relief from any of the treatment. One of her doctors told her that it would go away of itself, evidently thinking that the condition was due to an angioneurosis. She came to the Manhattan Eye and Ear Hospital Dec. 20, 1912.

Examination.—Patient was a well-nourished girl, skin of good color, light hair, freckled and weighed 110 pounds.

Mother said that patient cried from very slight cause, was very sensitive and rather nervous and easily excited, but had never had any fits or convulsions. The skin of the upper eyelids was pinkish red, and hanging down in a baggy, pouch-like mass and partially covering the eyes. This swollen portion of the lids looked like an edema of the subcellular connective tissues. The swelling hung down over most of the palpebral edge of the lids and this was more marked at the outer commissure. There appeared to be a ptosis of the lids, which was more apparent than real and the sagging of the lid was due to the weight of the pendulous mass of skin and subcellular tissue. There was, however, a true ptosis of the lacrimal glands. The swelling of the subcellular tissues, the bagging of the skin and the ptosis of the lacrimal gland were much more pronounced on the right side. The superficial veins in the lids were more prominent and perhaps slightly engorged. There was no limitation of motion of the lid or eye. Emotional excitement and the menstrual periods seemed to increase the puffiness and the redness of the lids. The skin and subcellular tissues of the lid felt soft to the touch and this bagginess of the lid could be reduced by pressure. The lacrimal gland could be distinctly palpated and could be rolled under the finger, but there did not seem to be a true hypertrophy of the gland structure. This condition had been stationary for the past year or more according to the statement of the mother. The Wassermann, von Pirquet and urine tests were all negative. Patient complained of some slight headaches at times and eyes tire on use.

Vision O.D. 20/20; accommodation type ƷI 7-38 cm.
Vision O.S. 20/20; accommodation type ƷI 7-42 cm.
Refraction under homatropin O.D. + 0.75sp. + 0.25cyl axis 90° = 20/15.
Refraction under homatropin O.S. + 0.75sp. + 0.25cyl axis 90° = 20/15.

Treatment.—The non-operative treatment of the case consisted in the local use of eye-washes and the internal use of Blaud's pill. On March 20, 1913, an operation was done on the right lid. A curved incision was made on the upper lid about 1½ inches long and about ½ inch above the palpebral margin of the lid. The upper border of the incision followed as near as possible the curve of the tarsal cartilage. After careful dissection of the superficial fascia of the lid a yellowish thickened tissue appeared which is never seen in the normal lid. This tissue was about 3 or 4 mm. thick and seemed to extend from directly beneath the skin to the tarsal plate. On continuing the dissection of this tissue a mass of tissue resembling fat pushed itself into the line of the incision and a free opening permitted it to prolapse into the wound. This seemed to extend back into the orbit and could be very nicely traced back and up along the superior wall of the orbit. This mass of tissue was carefully removed. After its removal the superior lobe of the lacrimal gland came forward and as it was thought that it would prolapse more after the removal of the mass of fat, the gland was removed with little trouble and almost no hemorrhage. Great care was exercised to prevent hemorrhage during or after the operation on account of the danger of pressure in the orbit and later on the optic nerve itself. With curved scissors a strip of skin was removed from the upper edge of the original incision and after that a portion of this hypertrophied tissue which was situated between the skin and the deeper tissues of the lid. In suturing the wound a series of buried catgut sutures were put in the deep subcutaneous tissues to prevent, if possible, any tendency to the formation of fat hernia. The skin and the tissues underneath were next brought together with silk sutures to avoid any keloid formation on the scar. A layer of white petrolatum was spread over the incision and stitches and compress bandages were then applied.

The treatment of blepharochalasis, as far as local means are concerned, has been, up to the present time, quite unsuccessful. The local injections of alcohol, iodin and the solution of zinc chlorid has not produced any permanent results. In my first case the electric needle was used with the hope of setting up a cellulitis of the subcutaneous tissues of the lid, with secondary contraction and shrinkage of all of the surrounding tissues, but this did not follow a most persistent use of the needle. The Roentgen ray and the high-frequency current or the violet rays have not been of any service. The use of any general medication has not been followed by any improvement of any of the symptoms. The fact that none of the cases presents any general dyscrasias would seem to be a partial explanation why we do not get any results from this form of treatment.

The only method of dealing with this condition is surgical. Many of the cases have been operated on with a varying degree of success. Simple excision of the skin of the lid with removal of a portion of the skin has not been found to be sufficient to correct the defect. Some of the operations have been followed by what looked like a keloid formation of the scar. Some of the operators have had hernias of the fat and subcutaneous tissues of the lid through the edges of the wound. Rohmer thinks that a special operation is indicated as the esthetic question is the thing that the patients have uppermost in their minds. One must not fear to excise too much and his experience has shown that all of the affected skin area must be extensively resected and even then the result will not be perfect. He has had ugly lumps form which swell at times. If a fatty lump should present during the operation, as much as possible should be removed in order to prevent these hernias of fat as already spoken of. One must exercise great care in the closing of the wound, using catgut sutures and a pressure bandage after placing over the edges of the wound fenestrated silk tissue or petrolatum to avoid any possibility of the dressing adhering to the wound. One of Rohmer's cases he has been able to observe five years after the operation and there is no tendency to recurrence because he removed with his incision all of the affected skin tissue. His other two cases have not been of more than six months' duration at the time of report and therefore no conclusion was justified

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ABSTRACT OF DISCUSSION

Dr. Edgar S. Thomson, New York: I can only speak from the experience of these two cases, both of which I saw with Dr. Weidler. The thing that impressed me most of all was the fact that they remained absolutely stationary no matter what was done. It seems that it is perfectly proper to classify them as dystrophias and I think there is no question that the angioneurotic edemas have no resemblance either in onset or duration. The seton was used after a rather interesting case of facial erysipelas was reported in the *British Medical Journal*. The author describes a thickening of the lids following the erysipelas and mentions the use of the seton through the upper part of the lid and down on the side of the face to establish lymphatic drainage. As Dr. Weidler said, it was unsuccessful in our cases. In view of the operative and microscopic findings, as well as the clinical history, I think operation is the only treatment. I am absolutely in the dark in regard to the nature of this fatty mass. It did not impress me as of the character of a new growth. In fact I think it is well known that it is dangerous to talk about lipoma in the tissues of the orbit unless there is a well-marked new formation. The mass had the appearance of cellular adipose tissue more than anything else. It is possible that, if taken during the edematous stage, the seton might have accomplished more, but later on it certainly seems that operation is the only course. There was marked disturbance, ptosis, swelling, etc., although Dr. Weidler dissected the mass with great care, with a minimum amount of traumatism. It shrank up in a few days and the patient now has good motion of the lid and the case looks very well.

DR. ARTHUR J. BEDELL, Albany, N. Y.: In a girl of 16, American, for at least five years the eyelids have been thickened although her physician believes they have lessened in the past year. Examination of the blood, urine, etc., showed no other organic lesions. Both eyelids present a boggy swelling and the appearance of ptosis. The lacrimal glands are not enlarged. The patient has refused operation and so it is impossible to report on the microscopic findings.

DR. WALTER BAER WEIDLER, New York: I hope that there will be a more careful classifying and reporting of these cases in the future and I believe that there are many more of these cases than a search of the literature reveals. Dr. Lewis told me that he had seen a case which he believed was one of blepharochalasis. Bach, who performed the operation described in the paper, on removing the mass of fat thought it was a true lipoma, but I think that it was only orbital fat. The patient, as Dr. Thomson has stated, had a marked degree of ptosis following the operation and the lid was closed for three or four days afterward; but this condition slowly cleared up and the lids regained the normal position and movements. I would like to warn any one who does this form of operation to be very careful in inserting the sutures. The first row should begin deep in the orbital tissues and these tissues should be brought well together and the skin edges united with great care. Several of the cases that have had an operation for this condition have been followed by fat-hernias through the edges of the wound and others have seen keloid formations along the line of the scar. In my patient the excision was done first on the right side and about a month later on the left and the results on both sides have been most gratifying and the deformity is entirely removed. I believe that it would be much easier to operate on these cases of blepharochalasis after the swelling has disappeared and we only have to deal with the bagging skin of the lids.

EQUIVALENT VALUES IN SPECTACLE LENSES

WILLIAM E. SHAHAN, A.M., M.D.
ST. LOUIS

By lens-grinders and spectacle salesmen, the powers of spectacle lenses are computed by simple additions and subtractions; a lens which has a + 5 D. surface on one side and + 5 D. surface on the other, is called a + 10 D. lens. Also a lens which has a + 20 D. surface on one side and a — 10 D. surface on the other, is called a + 10 D. lens. But it is found in practice that if this double convex +10 D. lens accurately measures a defect in an eye, and a meniscus lens of this form is ordered with the — 10 D. surface next the eye, an overcorrection of more than 2 D. will exist. In other words this meniscus lens with a conventional value of + 10 D. has a value equivalent to that of a double convex lens of more than + 12 D. Moreover the ordinary neutralization test fails in such a case as this, for if a — 10 sph. lens is held in contact with the convex surface of this meniscus lens, it will very nearly neutralize it. Discrepancies similar to this prevail in all meniscus and toric lenses, and because of the absence of some practical way of easily making compensatory computations the advantages accruing from the use of such lenses have been largely lost, except in the weaker forms.

Most of the principles of changes in the powers and properties of lenses with changes in their forms have long been known to expert mathematicians and physicists, and there are many text-books on geometrical optics from which these principles can be extracted by expenditure of sufficient time and labor. Even in the most modern text-books on ophthalmology, however, there can be found scarcely an echo of the progress made in geometrical optics since the work of Gauss (1841) or even that of Wollaston (1803). It is with a view to bringing to practical usefulness some of these principles that the present work is attempted. Because of the widespread looseness in defining focal lengths in text-books on ophthalmology, an elementary description of the usual method of geometrical optics will be here attempted.

Parallel rays of light near the axis, striking the left surface of a positive lens, as in Figure 1, come approximately to a point on the other side. This point is universally recognized as the second principal focus of the lens. Likewise similar rays striking the right surface come to a point on the left side of the lens in the first principal focus. Either of these points is universally agreed on as one of the points from which to measure focal lengths. It is with regard to the selection of the other point that so much confusion exists. This other point was definitely and accurately fixed by Gauss through observation of the behavior of the image as an object approaches a lens. If an object is very far to the left of a positive lens there will be a small inverted image of it very near the second principal focus. As the object approaches the lens the image moves away and becomes larger. When the object reaches a certain point twice the focal length of the lens on the left side, the image will occupy a corresponding point on the opposite side where it will be exactly the same size as the object, but still inverted.[1] As the object continues to approach the lens the image continues to recede from it and grows larger. When the object is in the first principal focus, the image is very far away and very large. When the object passes the first principal focus, so as to get between it and the lens, the image changes to the left side of the lens, is very large, very far away, virtual and upright. As the object continues to approach the lens the image rapidly approaches the object, becoming smaller. It finally catches up with the object and passes it, getting smaller, until a point is reached where the object and image are again of the same size, the image remaining upright and virtual. The planes occupied by the object and image in this position, where both are upright and of the same size, are known as the first and second principal planes of Gauss, and the points where they cut the axis as the first and second principal points of Gauss. These are most commonly referred to simply as the first and second principal planes and points. These planes and points can always be accurately located both by experiment and mathematical computation. In lenses in air the first principal point is always the same distance from the first principal focus as the second principal point is from the second principal focus. One of these principal points is now universally agreed on, except in text-books on ophthalmology, as the other point from which to measure focal lengths. The focal length of a lens in air is then defined in this paper as the distance between either principal focus and the corresponding principal point. There are two other points which in a lens in air coincide with the principal points. These are the nodal points, and in text-books on ophthalmology focal lengths are frequently stated to be distances between principal points and nodal points. This should be especially guarded against, as it may lead students into believing that the focal lengths of the eye itself are measured from nodal points to focal points.

With this understanding of principal points, focal points, and focal lengths, we are now in a position to

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[1] The principal planes of Töpler.

study changes in these points and lengths brought about by changes in the bounding surfaces of a lens.
first, (*A*) is a double convex lens with each of its surfaces

In Figure 1 are shown four lenses whose rims are in the same plane, as shown by the dotted line (1). The equal to + 5 D. It will be noted in this lens that the principal planes 1, 2 are within the glass symmetrically placed on each side of the center. The second principal focus of this lens is in the dotted line (2). The second (*B*) is a convexo-plane lens. Here the first principal point is in the curved surface of the lens, while the second principal point is within the glass about two-thirds of the thickness of the lens in front of the plane surface. The second principal focus is in front of the dotted line (2) and therefore nearer the dotted line (1). This + 10 D. lens, then, when its curved surface is turned toward the incident light, has the effect of a lens somewhat stronger than the + 10 D. lens *A*. The third (*C*) is a meniscus lens of which the anterior surface is + 21 D. and the posterior surface is — 11 D. In this lens the first and second principal points are both in front of the anterior surface of the lens. The second principal focus is considerably in front of the dotted line (2). This lens, therefore, when its convex surface is turned toward the incident light, has the effect of a lens of notably greater strength than that of the lens *A*. The fourth (*D*) is a meniscus lens of focal length equivalent to that of the double convex lens *A*.

The effective strength of each of these lenses depends on the distances through which the second principal points are advanced from the plane of the rims of the lenses (dotted line), and on a certain amount of absolute shortening of the focal length as the lens assumes the meniscus form. If, now, some way can be devised for calculating the actual focal length of the lens and the distance through which the second principal point advances as the lens changes its form, it will be easy to find its effective or equivalent value in terms of any other lens.

In this paper lenses are said to have the same equivalent value when parallel rays of light near the axis are brought to a focus at the same distance from the plane of the rim of the lens. As will be seen later, this change in position of the second principal point will have to be computed in two parts: the distance of the second principal point from the apex or pole of the posterior surface of the lens, and the distance of the pole of the second surface from the plane of the rim of the lens.

In order that the properties of a lens may be discussed in a mathematical way it is necessary to have at hand certain essential facts: the refractive index of the glass of which the lens is made, the thickness of the lens, and the radii of curvature of its bounding surfaces. This last involves a knowledge of the radii of curvature of the tools with which these surfaces are ground, and with which they coincide. The glass used by my opticians happens to be what is known as "B & L" glass and the refractive indices for various rays of the Fraunhofer scale were kindly furnished me by the Bausch and Lomb Optical Co. The refractive index of the Fraunhofer ray D. is generally used in geometrical optics as the standard. In this case it is 1.5225. The thickness of all positive lenses, except where the radii are equal, can be computed if the diameter of the lens and its radii of curvature are given. In this paper the greatest diameter (the major axis in elliptical lenses) of all lenses is fixed at 40 mm. which corresponds to the "00 eye" of the opticians.

The radii of curvature of the surfaces of the lenses can be determined from a consideration of the tools by which they are ground. Each tool is adapted for one fixed surface and the number of surfaces which the ophthalmologist can dictate therefore is limited by the number of individual tools which his optician possesses. The radii of curvature of these tools are computed from the ordinary formula for refraction at a spherical surface: $f = \frac{r}{n-1}$ where f is the focal length of the surface measured from the apex of the surface, r the radius of curvature of the surface and n the index of refraction of the glass. Now if $D =$ the power of the surface in diopters, then $D = \frac{1}{f} = \frac{n-1}{r}$ Since $n = 1.5225$ in this paper, $D = \frac{0.5225}{r}$ in meters, or $D = \frac{52.25}{r}$ in cm., whence $r = \frac{52.25}{D}$ cm. From this last formula by substituting the dioptric value D of a surface of any lens ground with "B & L" tools, the radius of curvature of that surface can be found. For example if the lens has a — 10 D. surface on one side, the radius of curvature for that side will be $r = \frac{52.25}{10} = 5.225$ cm. For the long series of computations made in this work these radii were computed at diopter intervals up to 30 D. and the results tabulated for rapid reference.

Now let t be the thickness of a plano-convex lens, t′ that of a double convex, and t″ that of a meniscus lens. It can be shown by simple geometrical methods that $t = r - \sqrt{(r-y)(r+y)}$, $t' = 2r - 2\sqrt{(r-y)(r+y)}$ and $t'' = r - \sqrt{r^2-y^2} - (r' - \sqrt{r'^2-y^2})$ where r is the radius of curvature of the anterior surface, r′ the radius of curvature of the posterior surface and y the semidiameter of the lens. The last equation is merely the difference between two planoconvex lenses. So that when the thicknesses of the 26 possible whole-diopter planoconvex lenses, with semidiameter $y = 2$ cm. have been calculated, the thicknesses of the 325 possible whole-diopter meniscus lenses with semidiameter $y = 2$ cm. can be obtained by simple successive subtractions. This was done and the results tabulated for ready reference. To all these minimum thicknesses 1 mm. is arbitrarily added as an approximation of the thickness the optician will allow at the edge of the lens.

This gives all the data necessary for the computation of focal lengths, equivalent focal lengths, powers and equivalent powers of any given form of lens in terms of any other form. If H′ represents the distance of the second principal point in front of the apex of the posterior surface of the lens, d the distance of the apex of the posterior surface of the lens in front of the plane of the rim of the lens, F the focal length of the lens and E F the equivalent focal length of the lens, then $E F = F - (H' + d)$. That is, the equivalent focal length is the distance from the plane of the rim of the lens to the second principal focus. Now $F = \frac{-r r'}{(n-1)(r - r' - \frac{(n-1)t}{n})}$ *

$H' = \frac{-\frac{r'}{n}t}{r - r' - \frac{n-1}{n}t}$ * and $d = r' - \sqrt{(r'-y)(r'+y)}$

which is the thickness of a planoconvex lens, fitting accurately into the concavity of the meniscus lens. When these values are substituted in the equation $E F = F - (H' + d)$ the equivalent value of a meniscus lens in terms of a double convex lens is obtained. Since

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* Adapted from Heath's Geometrical Optics, Second Edition, page 69.

EF is in centimeters the equivalent value in diopters will be $\frac{100}{EF}$. In double convex lenses the second principal point is slightly to the right of the plane of the rim of the lens. So that a small quantity $\frac{HH'}{2}$, where HH' is the distance between the principal points is neglected in the equation $EF = F - (H' + d)$. Since planoconvex and meniscus lenses are always set nearer the eye than double convex lenses, it is more accurate for this quantity to be neglected. If now a fixed value, say — 11 D is assigned to the posterior surface of a lens, and its anterior surface allowed to vary by diopter intervals from + 11 D to + 25 D (which is the maximum for a lens where $y = 2$ cm. and $ND = 1.5225$) two sets of values will be obtained: first, the ordinary conventional values obtained by simply subtracting one surface from the other, and second, the equivalent values obtained from the equation $EF = F - (H' + D)$.

More than two hundred independent solutions of the equation $EF = F\ (H' + d)$ were required to obtain sufficient equivalent values for use as points in the construction of curves from which all equivalent values might be readily read off. These solutions were made with seven-place logarithms taken from Vega's tables, and each point calculated to the thousandth part of a diopter. Each series of points for each meniscus lens of fixed posterior surface was then laid out on coordinate paper, and connected by a smooth continuous line through the agency of a spline and a number of weights. The conventional values of all meniscus lenses are plotted along the left vertical margin of each chart and the corresponding computed equivalent values for double convex trial case lenses are plotted along the lower horizontal margin of each chart.

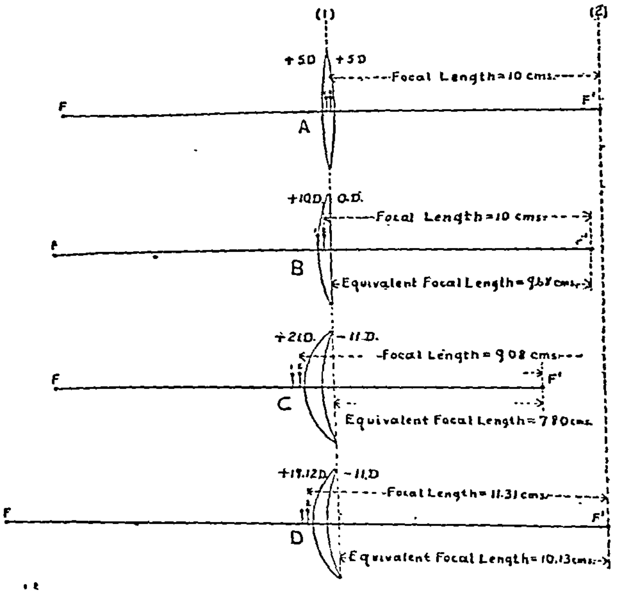
(1)
(2)
+5D
+5D
Focal Length = 10 cms.
F
F'
A
+10D
0.D.
Focal Length = 10 cms.
B
Equivalent Focal Length = 9.67 cms.
+21D.
-11.D.
Focal Length = 9.08 cms.
F
F'
C
Equivalent Focal Length = 7.90 cms.
+19.12D
-11.D
Focal Length = 11.31 cms.
F
F'
D
Equivalent Focal Length = 10.13 cms.
= First and Second Principal Planes
F F' = First and Second Principal Foci

Fig. 1.—First and second principal planes and foci.

PRACTICAL RULES FOR USING THE CHARTS

Figure 2 is a general chart giving equivalent values for all meniscus lenses with posterior surfaces ranging from zero to —20 D. This is especially useful for high powers. Figure 3 is a special chart for convenience in reading off equivalent values for the common commercial meniscus whose posterior surface is —6 D and for ordinary toric lenses whose common base is 6 D. The divisions in both these charts are diopters, halves, quarters and eighths of diopters. Figure 4 is a general chart giving equivalent values to 6½ diopters only and the divisions are diopters, halves, quarters, eighths and thirty-secondths of diopters. This is designed for determining equivalent values for weak lenses in order to decide whether or not the differences are small enough to neglect with safety. Each type of lens will now be taken up in detail.

Double Convex Lenses.—If a double convex trial case lens is used, and it is desired to find an equivalent meniscus, first decide what the posterior surface is to be, then seek out along the lower horizontal margin of any of the charts the number representing the dioptric value of the lens used in the trial measurements, next follow the vertical line leading from this point directly upward to the curve marked P. S.= the chosen posterior surface, then follow the nearest horizontal line leading from this point to the left margin and add to the number found there the numerical value of the chosen posterior surface; the sum of these two numbers is the dioptric value of the front surface of the equivalent meniscus. For example, suppose that the patient has an aphakial eye and his defect is measured by a + 12 double convex trial case lens and it is desired to prescribe a meniscus lens whose posterior surface is — 11 D. Using Figure 2, the number 12 is found on the horizontal margin under the heading "Equivalent Values of Double Convex Trial Case Lenses." The line leading from there is followed up to the curve marked P. S.= — 11. From this point the nearest horizontal line is followed to the left vertical margin marked "Conventional Values of Meniscus Lenses." The number found there is 9.50. This added to 11 gives the desired anterior surface. The meniscus with — 11 D posterior surface equivalent to a + 12 D double convex lens has therefore an anterior surface of + 20.50, so that the prescription for the optician would be:

℞ Back surface........................ —11 sph.
Front surface........................ +20.50 sph.

Other examples are:
For double convex + 12 sph.:

℞ Back surface........................ —14.50 sph.
Front surface........................ +23 sph.

For double convex + 15 sph.:

℞ Back surface........................ —12 sph.
Front surface........................ +23 sph.

For double convex + 20 sph.:

℞ Back surface........................ —10 sph.
Front surface........................ +24 sph.

In all cases "B. & L." glass on "B. & L." tools "00 eye" with greatest diameter = 40 mm.

Planoconvex Lenses.—Although computations for points used in constructing the charts were made for equivalent values in terms of double convex lenses, equivalent values in terms of planoconvex lenses can be read off with equal facility. This arises from the fact that a planoconvex lens is nothing more or less than a meniscus lens whose posterior surface is zero. The first curve in all the charts is, therefore, a planoconvex curve. Moreover, the conventional value of a planoconvex lens is also its actual value. If, then, an aphakial eye requires a + 12 D planoconvex lens to bring its vision to a maximum, and it is desired to prescribe a meniscus lens with P. S.= — 11, we find on the left vertical margin of Figure 2 under "Conventional Values of Meniscus Lenses" (remembering that these are the actual values of planoconvex lenses) the number 12, and follow the horizontal line leading from this to the curve marked P. S. = 0; from this point we drop directly downward to the curve marked P. S. = — 11; from this point we follow the nearest horizontal line back again to the left margin and add the number found there to the number 11 for our front surface. The nearest number found there is 9.87. This added to 11 gives + 20.87 for the front surface. The nearest tool the optician has to this number is + 21, so that our prescription would be:

℞ Back surface........................ —11 sph.
Front surface........................ +21 sph.

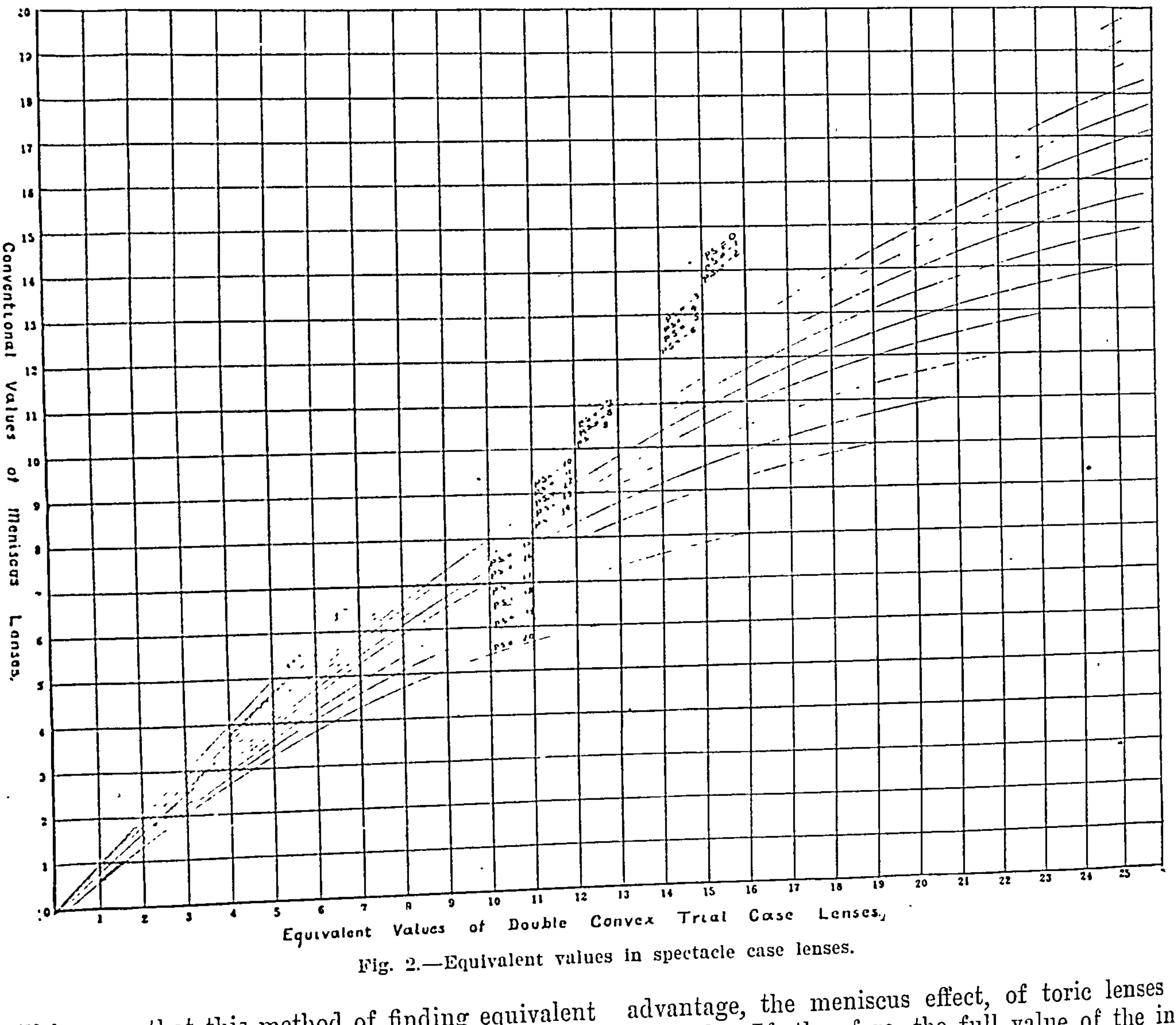

Fig. 2.—Equivalent values in spectacle case lenses.

It will be seen that this method of finding equivalent values of planoconvex lenses is the same as finding the values of the planoconvex lenses in terms of double convex lenses and then using these values as if double convex lenses had been used in making the trial tests. Other examples are:

For planoconvex + 15 sph.

℞ Back surface........................ — 6 sph.
Front surface........................ +19.50 sph.

For planoconvex + 6.50 sph.

℞ Back surface........................ —18 sph.
Front surface........................ +22.50 sph.

Toric Lenses.—Lenses having toric surfaces have been designed in order to extend to patients afflicted with astigmatism the benefits of meniscus lenses, and the degree to which such benefits can be extended will depend wholly on the ability with which the practical lens grinder can fashion such surfaces. At one time there was a variety of basic curves used for toric surfaces, but opticians have now quite generally settled down to a 6 D curve on which cylindric curves are superimposed. Moreover, it has been found that fewer mechanical difficulties beset the grinding of positive than negative toric surfaces. In consequence of this, unfinished lenses which are sold in wholesale quantities to retail opticians have on their front surfaces + 6 D sph. with any desired cylindric increase in one meridian. If it is desired to order, say + 7 sph. + 3 cyl., and a toric lens is designated without further specification, the finished lens will have on its front surface +6 sph. + 3 cyl. and on its back surface + 1 sph. This sacrifices the chief advantage, the meniscus effect, of toric lenses of this strength. If, therefore, the full value of the increased cost of toric lenses is to be secured for a patient it becomes necessary to dictate both surfaces.

In taking from the charts equivalent values for toric lenses, discrepancies arising from the interval between the two trial lenses used in making the refractive measurements are, as usual, neglected and the trial combination considered as if composed of one lens with its meridians of unequal power. The equivalent value of the two principal meridians can then be taken as if each were a separate lens. Suppose, for example, that the patient's refractive defects are corrected by + 10 sph. (double convex) + 4 cyl. ax. vert. Knowing that your optician's toric tools are on a 6 D base, you can at once write down:

Back surface — 6 sph. — 4 cyl. ax. hoz. That is, one meridian which is — 6 D and another which is — 10 D. Now, one of the meridians of your trial combination is + 10 D and the other is + 14 D. The weakest negative meridian is always behind the strongest positive meridian. Accordingly the two meridians can be considered as two lenses for which equivalent values are desired. One of these is the equivalent of a + 10 D double convex with P. S. = — 10 D and the other a + 14 D double convex with P. S. = — 6 D. From Figure 2 we find for the equivalent of + 10 double convex lens with P. S. = — 10, front surface = + 18.37 and for the equivalent of a + 14 double convex lens with P. S. = — 6, front surface = + 18. The front surface of the finished lens is, therefore, between + 18.37 sph. and + 18. sph., compromising on + 18.25. The prescription will be:

℞ Back surface.......... —6 sph. —4 cyl. ax. hoz.
Front surface.......... +18.25 sph.

If the trial lenses were planoconvex lenses the prescription would be:

℞ Back surface.......... —6 sph. —4 cyl. ax. hoz.
Front surface.......... +18.50 sph.

The front surfaces for the two meridians are so nearly identical that in practice it will be necessary to find the front surface for only one meridian and use that for the front surface of the finished toric lens, using Figure 3, therefore, equivalent toric lenses in terms of either planoconvex or double convex trial lenses can be obtained by the following simple rule: Write down at once for the back surface — 6 sph. with a minus cylinder at right angles to the plus trial cylinder (if a plus cylinder was used). Then find the equivalent front surface of the lens of power equal to the strongest meridian of the combination used with P. S. = — 6 and write this down for the front surface of the toric lens. For example: For + 8 sph. (double convex) + 2 cyl. ax. 45°.

℞ Back surface.......... —6 sph. —2 cyl. ax. 135°
Front surface.......... +15 sph.

For + 8 sph. (planoconvex) +2 cyl. ax. 45°.

℞ Back surface.......... —6 sph. —2 cyl. ax. 135°
Front surface.......... +15.25 sph.

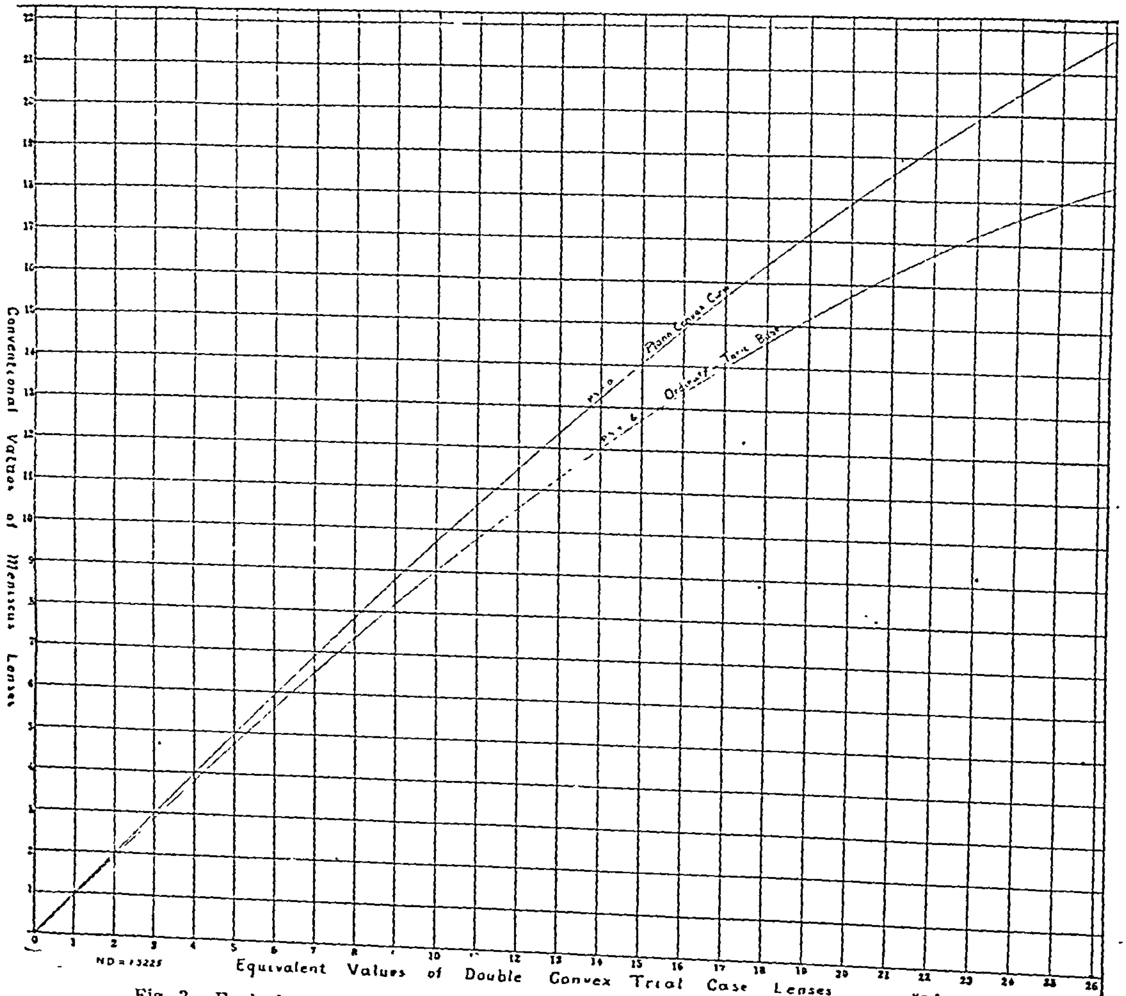

Fig. 3.—Equivalent values of double convex trial case lenses (for common toric lenses).

In both these cases the strongest meridian is + 10 D. In the first case the number 10 is found at the bottom of Figure 3; the vertical line followed from there to the curve P. S. = — 6 and the horizontal line followed from that point to the left margin and the number 6 added to the number 9 found there gives the front surface. In the second case the number 10 is found on the left margin of Figure 3, and the horizontal line followed from there to the curve P. S. = 0. Then the nearest vertical line is followed directly downward to the curve P. S. = — 6. From this point the nearest horizontal line is followed back to the left margin, and the number 6 added to the number 9.25 found there gives the front surface. This is exactly the procedure already described for simple lenses. With a little practice this can be done with ease and speed.

The variety of meniscus and toric lenses that can be ordered is practically unlimited. Fractional values for posterior surfaces are obtained by interpolation. The "back surface —14.50" shown, for instance, was obtained by choosing a point on the vertical line half way between the curves marked P. S.— —14 and P. S.— —15. Variations in the diameter and thickness of the lenses will cause variations in their values; but these are generally small enough to be adjusted by having the spectacle lens set a little nearer or a little farther away from the eye, as determined by actual tests of visual acuity with the finished lens.

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ABSTRACT OF DISCUSSION

DR. WILLIAM R. MURRAY, Minneapolis: In estimating the equivalent value of a meniscus lens, as compared to a biconvex lens of a given diopter strength, we must take into consideration the relative position of the plane of the rim of the lenses in reference to the apex of the cornea. In practice, if the rim of a plus meniscus lens of 10.00 D, having a posterior surface of —10.00 D, be placed in the same plane as the rim of a plus 10.00 D, biconvex lens, there will be an overcorrection amounting to about 2 D. Also if a —10.00 D sphere be placed against the anterior convex surface of this meniscus it will neutralize it, as the posterior principal point of the biconcave sphere very nearly coincides with the second principal point of the meniscus. Theoretically the two lenses are of equivalent strength, as the focal length is the same in both lenses. It is then a question of the relative position of the two lenses in reference to the eye, as to whether they are equivalent in practice. As we cannot bring the meniscus lens near enough to the surface of the cornea to make the second principal point coincide with the second principal point of the biconvex we find that the two lenses are not equivalent and some method of computation is necessary whereby we can determine the equivalent value of a meniscus lens in the position which it will occupy in reference to the eye. The overcorrection which would result if a plus 10.00 meniscus were substituted for a plus 10.00 biconvex lens, with the rim of the lenses in the same plane, would be partially eliminated, if the plane of the rim of the meniscus is brought near enough to the eye to allow the apex of the posterior surface of the meniscus to occupy about the same plane as the apex of the posterior surface of the biconvex. The two practical points to be considered in determining the

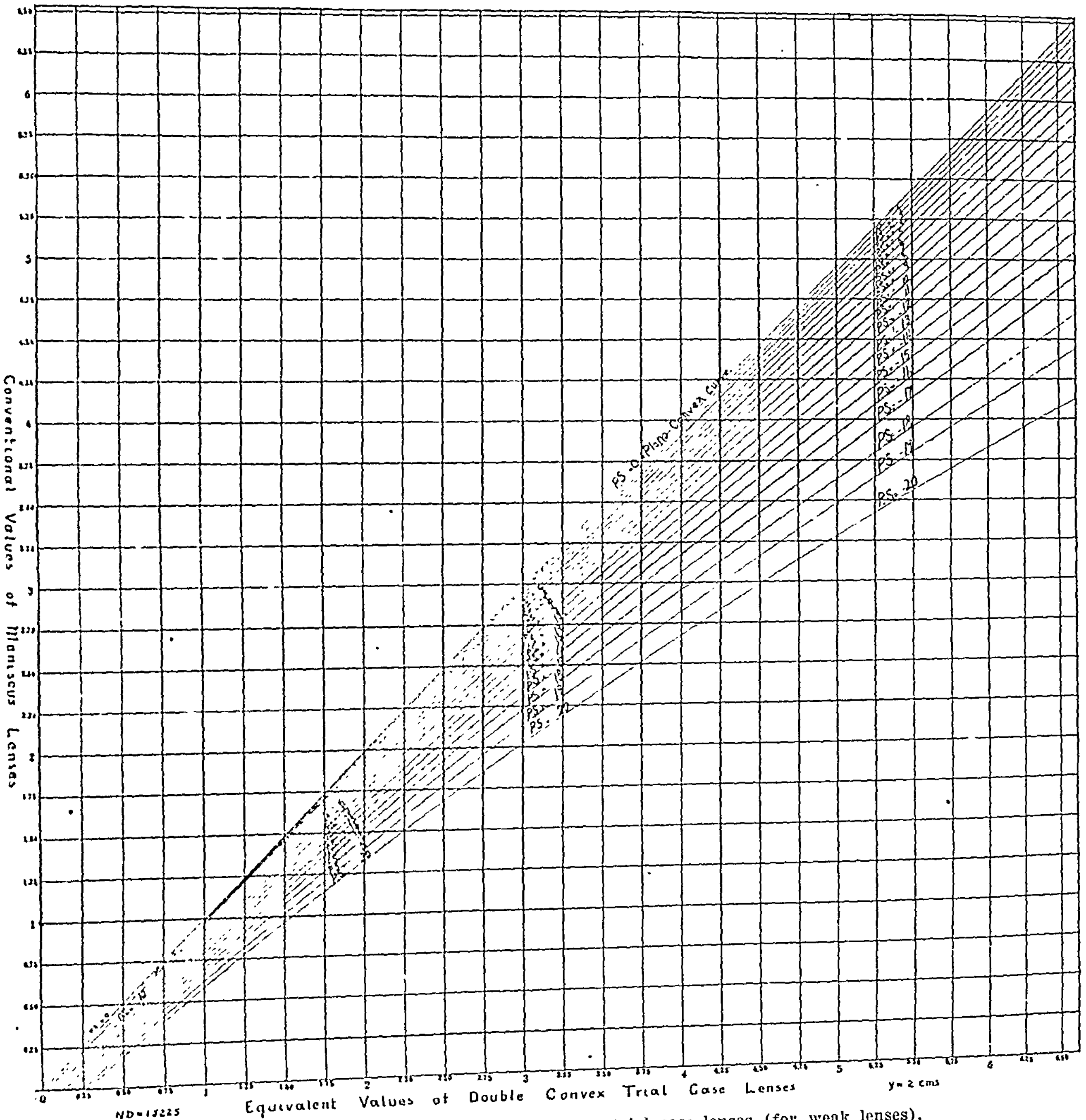

Fig. 4.—Equivalent values of double convex trial case lenses (for weak lenses).

equivalent value of a meniscus as compared with a double convex lens are the distance between the apex of the posterior surface and the plane of the rim of the lens, and the distance between the apex of the posterior surface and the second principal point. The first point can be largely eliminated, owing to our being able to bring the plane of the rim of a meniscus of high diopter strength considerably nearer the eye than the plane of the rim of a biconvex of the same strength. The second point becomes one of practical importance as the focal length of a lens is measured by the distance between the second principal point and the second principal focus and in a meniscus lens of high diopter strength, as compared with a biconvex lens of the same diopter strength. In a plus meniscus lens of 10.00 D, with a posterior surface of minus 11.00, the second principal point lies near the anterior surface of the lens and outside of the lens; in a plus biconvex lens of 10.00 D, the second principal point is within the lens and posterior to the plane of the rim of the lens. When the meniscus is brought into its proper position, in reference to the eye the second principal point will still be anterior to the second principal point of the biconvex lens, in its proper position before the eye, and this difference will approximately equal the thickness of the biconvex lens. It becomes necessary to make a certain allowance in estimating the equivalent value of the meniscus lens and any method of computation by which this equivalent value can be furnished for ready and quick reference is of practical value.

There is no doubt but that, in many cases, the meniscus lens offers many advantages over the biconvex or plano convex lens and in order to obtain the maximum advantages of a meniscus in certain cases, as in cataract lenses, we should be able to prescribe the degree of concavity of the posterior surface. In this country the opticians are furnished with plus menisci lenses having a posterior surface of minus 1.25 and minus 6.00. Plus menisci lenses having a posterior surface of minus 9.00 may be obtained but at a considerable increase in cost, while if we wish to prescribe a lens having a posterior surface of minus 10.00 or minus 11.00 it requires special grinding at much greater cost.

This is somewhat of a disadvantage, at present, to our prescribing such lenses and means should be devised whereby menisci lenses of the most suitable degree of concavity can be obtained at a reasonable cost.

Dr. F. Park Lewis, Buffalo: It is quite evident that the difference between the bifocal lens and the meniscus lens must, in the higher degrees, affect the values. We have all known that the optical center of the lens is of importance in relation to the eye, but we have usually made the correction by approaching the stronger lenses closer to the eye or withdrawing it somewhat further from it. Dr. Shahan's method, even when his chart is closely followed, would necessitate an approximation of values. The question arises: Why should we not have our test lenses made as are our ultimate prescriptions, that is, in menisci. We have all been annoyed by the discrepancies between the optician's lenses and the prescription which we have made, and the seeming discrepancies would be explained by the fact that our tests are made with bifocal lenses while our final prescription is in toric form. A second point is this. If, as Dr. Shahan has pointed out, a discrepancy, in the stronger lenses, as great as 2 diopters may exist between the test lens and that which the patient receives, and we have only Dr. Shahan's chart to enable us to determine how great this discrepancy is, must not our final result in each instance be merely an approximation? The opticians have certain forms on which their lenses are ground. They cannot give us 19¼ or 19½ on one side, and unless in special lenses we should have special forms made which would be so expensive as to be impracticable, we must still vary our prescription from our findings. The subject is one of great importance, and the refractionist and the optician should certainly work together in order that it may be possible for the former to secure an exact reproduction of his office test in the final lens.

Dr Walter Baer Weidler, New York: I should like to ask Dr. Shahan whether this applies only to the higher degrees of lenses, or whether the condition which he found with his patients was also present in the lower degrees of refractive errors. In my own personal experience in attempting to wear toric lenses, to determine the additional values as claimed by the optical men, I found that I was very uncomfortable and absolutely unable to wear them. They had the very distinct advantage of giving a greater field of vision but on account of my own discomfort I have been averse to prescribing toric lenses.

Dr. George H. Price, Nashville: There is a popular idea that toric lenses are by far the best, and the judgment is that this is true theoretically. Practically they fall far short of what we desire, and patients are not infrequently disappointed, because of the facts brought out in this paper. They are disappointed because the ratio of increase from the smaller or lower power to the higher power is rapid and this increase in the refractive capacity of the lens induces marked symptoms. I once had a irritation in my eyes, and going to a drug-store, bought a pair of colored glasses. They were toric, pressed lenses. I noticed when I walked with them that everything seemed to be out of place—things were distorted and they induced nausea. The nausea would increase until I would have to take the glasses off. After a while I could wear them. My experience in prescribing torics, for patients who have worn biconvex or plain lenses or simple myopic lenses, has shown that when they put on toric lenses they return with a whole train of nervous symptoms not altogether easily explained. I have one patient now who has been accustomed to wearing glasses for some years. She wanted toric lenses because of the increase of the field of vision; but it has taken her now nearly three months to adjust herself to the toric lenses. They are very low in value, the strongest being 1 diopter and the other ½ diopter. These symptoms are very annoying. It is a great advantage to have a chart from which one can estimate the lenses. The low powers are not so distressing as the high powers. I read with toric lenses at night and if I don't feel well it makes me sick, though I do not have a high defect of vision. It is this constant draft on the nervous mechanism to adjust the eye to the lens itself which gives the distressing reflex disturbances, and with this chart we can properly correct them.

Dr. Joseph S. Lichtenberg, Kansas City, Mo.: Professor Gullstrand of the University of Upsala has worked up the formula for aspherical meniscus lenses to be used especially in cataract cases. They are made at present only by the well-known Zeiss firm in Jena, Germany. The data required by the lens grinders are: (1) the form of lens, biconvex or planoconvex and its strength in diopters; (2) whether in testing, the spherical or cylindrical lens was nearer the eye; (3) the strength in diopters and the axis of the cylindrical lens; (4) the distance from the summit of the cornea to the posterior surface of the lens nearest the eye and (5) the distance between the anterior surface of the lens nearest the eye and the posterior surface of the lens farthest removed from the eye. I find they are very satisfactory to my patients, as they have at least 60 degrees of field, which is a great deal better than any other lens we can obtain.

Dr. J. A. Donovan, Butte, Mont.: The Bausch and Lomb people furnish lenses with one refractive index and other makers another and we get confused in the index of the lens we are using. We are now using two normal standards in the indices of these lenses. Will it be necessary to have a table for each?

Dr. Walter B. Lancaster, Boston: A lens of the correct strength is not sufficient; it must be mounted the proper distance from the eye. After calculating exactly the lens we want to use and having prescribed it, the practical point is that when the patient comes in with that lens we must try it out in our offices and see whether slight changes in the distance from the eye are needed or whether putting ¼ or ½ or even ⅛ of a diopter in front will improve things. If it does we must either change the prescription or slightly change the distance of the lens from the eye. In many cases we must slightly tilt the frame to get the best correction for astigmatism. The frame furnished by the optician may vary a few degrees which can be corrected by slightly bending the frame.

Dr. William E. Shahan, St. Louis: I was induced to work this chart out on finding that conventional meniscus and toric lenses give overcorrection, so that the power of the lens must be reduced. The ordinary optician does not understand how to do this. In all branches of physical science it is necessary to have some definite point from which to make exact measurements. Because of this, it is best to keep the rim of the trial frame as nearly as possible in the position which the spectacle or eyeglass rim is expected to occupy. Gullstrand lenses have some advantages over ordinary meniscus or toric lenses but are more expensive, and more time is consumed in obtaining them. Meniscus trial case lenses probably would not be successful because of the varying positions of the principal points and the difficulty of combining them with cylinders. Planoconvex trial case lenses are probably the best possible form. The charts are based on glass with refractive index 1.5225. Other charts will have to be constructed for glass of other refractive index. Toric lenses unquestionably require greater care and skill both in fitting and in grinding than ordinary types. If, for instance, the center of the lens is not accurately set in front of the center of the pupil, some astigmatism of axial pencils will be obtained. If the lens for one eye is accurately centered and the other is not, a condition of anisometropia will be introduced. Our duty to our patient is never completed until we have seen him with the finished lens, taken his vision both through the center and periphery of the lens near each end of the major axis and searched for any possible residual defect. Other questions asked are covered in the paper.

METASTATIC OPHTHALMIA

REPORT OF THREE CASES, ONE OF WHICH RESULTED IN RECOVERY OF VISION

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CHICAGO

"Metastatic ophthalmia" is the name given to a serious inflammation of the structures of the eyeball that results from an endogenous infection of the retina or uveal tract. "Metastatic suppurative chorioiditis" is another term used for the condition, but as the septic process so frequently begins in the retina, and so frequently involves all the structures of the eyeball, the name "metastatic ophthalmia" would seem preferable. "Septic endophthalmitis" is a good name for the same condition, but even this does not indicate accurately the grave features of general inflammation in the severe cases, which resemble panophthalmitis from traumatic or ectogenous infection of the globe.

I desire to present a report of three cases of this disease, in one of which the result was so unusual as to make it of especial interest.

Case 1.—Oct. 3, 1910, I was called to see Mrs. H., aged 64, in consultation with Dr. William Cuthbertson and Dr. Capps. A few days before she had noticed a rather sudden failure of vision of the left eye, which had been preceded by a blurring or fogginess of the sight. She had had no previous evidence of glaucoma. The conjunctiva also showed considerable redness and some chemosis and the eyelids of that side became swollen, but not accompanied by pain.

She had been under treatment for cystitis for some time, and pus and albumin were found in the urine. Temperature was 102; blood-pressure 220 mm. There was a painful swelling of the right parotid gland which had developed a day or two before the time I first saw her. There was also a painful swelling of the left leg, which seemed to be due to thrombosis. The condition was that of general sepsis; there were no physical signs of endocarditis.

At the time of my first visit, the vision of the right eye was fairly good, but that of the left was zero. In the left eye there was marked chemosis with considerable dusky redness of the conjunctiva. The lids were also considerably swollen and there was some proptosis. The cornea and anterior chamber were clear, the pupil about 3 mm. in diameter and immobile, the lens clear and a greyish reflex was obtained from the vitreous with the ophthalmoscope. Tension was increased.

In the right eye there was no redness or chemosis of the conjunctiva; the cornea was clear, but the anterior chamber was rather deep. Pupil was clear and about 3 mm. in diameter. The vitreous was faintly hazy, but an ophthalmoscopic examination could be made and the optic disk seemed slightly reddened, the arteries small and the veins engorged. No hemorrhages and no plaques of exudate or degeneration were seen.

The next day, October 4, the condition of the eyes was worse. The sight of the right had failed rapidly, some chemosis had appeared, and the fundus was invisible because of the cloudy vitreous. Pupils had not dilated with a mydriatic. There was slight hypopyon in the left eye.

General condition was somewhat improved. In two days the right eye was as bad as the left and was totally blind. There was no great pain in either eye, the chemosis was not intense nor did the inflammatory process go on to the extent of making it necessary or wise to open the eyeball.

Dr. Capps found *Bacillus coli communis* in cultures from the urine, and from the blood *Staphylococcus aureus.*

The inflammatory process in the eyes was gradually subsiding, both corneae remaining clear, when the patient died from terminal pneumonia, presumably of embolic origin. Autopsy was not obtained. Death occurred twelve days after the infection of the eyes.

In this case there was a septic metastatic endophthalmitis probably caused by emboli of staphylococcus such as were found in the blood. Probably the same organisms caused the thrombosis in the leg. Although at one time the general condition of the patient seemed to be improving, the development of the disease so rapidly in the second eye indicated the profound nature of the sepsis and the grave prognosis.

Case 2.—J. A., aged 25, a well-developed young woman, early in January, 1912, had a severe tonsillitis, following which there was a suppurative otitis media of the right ear. Some weeks afterward she developed a pneumonia from which she recovered slowly; elevated temperature continued, with occasional chills, headache and general malaise. There was also severe pain in the head and it was thought she was developing a brain abscess, from the infection of the ear. The left wrist and the left knee became swollen and painful.

Feb. 25, 1912, Dr. Thomas Roberts referred her to my service at the Presbyterian Hospital and the following condition was noted: There was marked edematous swelling of the lids of the left eye. The conjunctiva was very red and there was considerable chemosis. The cornea was clear; the pupil was partially dilated, and lens was clear, but the vitreous was so cloudy that the details of the fundus were not visible. Tension was slightly minus. There was considerable pain in and around the left eye and some swelling of that side of the face. I was told these symptoms of the eye had developed three days previously beginning with a cloudiness of vision which had increased so that at the time of my examination she could only perceive light with that eye. The right eye was in every way normal.

Temperature was slightly elevated, being 100 and pulse was 90. There was still some pain and slight swelling of the left wrist and the left knee. The right ear was still discharging through a large perforation in the posterior-inferior part of the membrane. Dr. E. C. Rosenow made smears and cultures from the tonsils, the right ear and the conjunctiva of the left eye, and these showed streptococci of a highly virulent, moderately hemolytic, encapsulated type. They resembled organisms that he had recovered in tonsillitis and erysipelas cases of an epidemic character that had developed where a certain milk had been used. No organisms were found in the blood. In the conjunctiva were also large numbers of pseudodiphtheria bacilli.

The active symptoms gradually subsided, but in a few days there was no longer perception of light, and the eyeball began to shrink. A yellowish exudate could be seen filling the vitreous chamber. The pupil was fixed but the lens remained clear.

The treatment included irrigation of the conjunctival sac with boric solution, atropin and hot applications. Hexamethylenamin (urotropin) was also administered, 5 grains three times a day. When recently seen the eye was considerably shrunken but quiet.

This case illustrates one of the milder forms of the disease, but was probably caused by one of the virulent forms of streptococcus. Although the inflammation of the eye was not so intense as that of the preceding case, the general septic condition was very severe. The infection may have gained entrance through the tonsil or through the ear.

CASE 3.—Marion B., aged 18, a strong, healthy girl had a chill on Feb. 11, 1913, with headache and vomiting. The physician who first saw her found the tonsils inflamed, for which he gave treatment. A slight membrane appeared on the tonsils and a culture from this made by the Chicago Laboratory showed diphtheria.

Feb. 15, 1913, the physician injected 4,000 units of diphtheria antitoxin after which the throat began to clear, and two days later a second dose of 4,000 units was administered. At this time it was noticed that both eyes began to get red and the following day, February 17, she had dimness of vision and considerable pain in both eyes.

February 18, vision was reduced to perception of light and the eyes were congested and painful. At the request of Dr. Bebb, who had been called in attendance, I was consulted at this time and the case was seen by my associate Dr. Darling, who prescribed atropin, dionin and hot applications. A smear from the conjunctiva showed numerous staphylococci.

February 20, the patient was brought to the Presbyterian Hospital where I first saw her. There was marked ciliary congestion in both eyes and some chemosis. The pupils were beginning to dilate from the atropin that had been used for two days, and there was considerable pain in the eyes and in the temporal regions. There was a dense exudate in the pupil covering the central portion of the anterior surface of the lens, and a slight red reflex could be obtained around this, but the vitreous was cloudy and the details of the fundus could not be seen. She could perceive hand movements with each eye. Patient had temperature of 100; pulse 90. A subconjunctival injection of 1 c.c. of physiologic salt solution in each eye, hot applications, dionin and sodium salicylate (15 grains every three hours) were ordered. The next day the condition of the left eye was somewhat improved, the pupillary exudate was less and the pupil was dilated, but the vitreous was very cloudy.

The right eye had not changed very noticeably except that the pupil was slightly wider. Vision of the left eye was better, for she could distinguish forms. Cultures made from the tonsils by Dr. E. C. Rosenow showed *Streptococcus viridans*, and from the conjunctiva staphylococci were obtained. Examination of the blood for organisms gave a negative result.

The subconjunctival injections of salt were repeated and the throat was ordered swabbed with hot 33 per cent. alcohol several times daily followed by 25 per cent. argyrol. Irrigation of conjunctiva with 1: 5,000 mercuric chlorid every four hours followed by application of 1: 3,000 mercuric chlorid ointment.

Feb. 22, 1913, considerable reactions from the injections the day before and some chemosis were present, but the condition of the eyes was greatly improved, for the pupillary exudate of the left eye had almost disappeared and the pupil was evenly dilated. The vitreous was still cloudy but the details of the fundus could be indistinctly seen and she could count fingers 8 or 10 feet away. The right eye was painful and congested, but the pupil was clearer than it was on the previous day. Treatment continued, with exception of subconjunctival injections. Improvement continued steadily so that in a few days the pupillary exudate had disappeared, the details of the fundus could be indistinctly seen through the hazy vitreous and the vision had correspondingly increased.

March 8, 1913, pupils were evenly dilated, no visible trace of the pupil exudate, and the vitreous fairly clear, so that the details of the fundus could be easily seen. Around the posterior pole of each eye was seen a pronounced halo of shimmering radiating lines in the retina; these were not opaque, for they would change their position slightly as the light was thrown from different angles, but they were much more intense than any halo I have seen around the yellow spot or in a "watered silk" appearance of the retina. No other change in the fundi.

Vision in each eye had improved to 6/10 with sph. + 1.00.

March 15, 1913:

R. V. c. Sph. + 1.00 Cyl. + .25 90=6/6—2
L. V. c. Sph. + 1.25 Cyl. + .25 90=6/6—3

The only remaining external evidence of the severe inflammation she had is a congestion of some of the larger veins of the eyeballs and this is disappearing.

The unusual recovery in this case might cause one to doubt that it was in reality an example of true metastatic ophthalmia of embolic origin, but this doubt was dispelled from my mind by the rapid onset, the severity of the inflammation and the clinical appearances.

Probably the infection was confined more particularly to the anterior part of the uveal tract, and whether due to the diphtheria bacillus or to a streptococcus, its course must have been profoundly influenced by the antitoxin or the reaction occasioned by the subconjunctival injections.

Fortunately cases of this disease are less frequent than they were before the introduction of antiseptic methods in obstetrics and surgery, for the pyemias and septicemias of preantiseptic days frequently manifested themselves by metastatic processes in various parts of the body and the eye was often affected.

I presume it is safe to say that the majority of cases occurring nowadays are cryptogenetic in character or complicate some distinct infectious disease. The disease may be unilateral or, in severe infections, bilateral, but both eyes are usually not affected simultaneously. The first symptom noticed by the patient is a blurring of the vision of one or possibly both eyes. If the physician is fortunate enough to be able to make an ophthalmoscopic examination at this time, he will notice that the vitreous is already slightly cloudy. The outlines of the optic disk will appear blurred and indistinct and the disk itself somewhat reddened. The retinal veins will be engorged, and tortuous because of edema of the retina.

There may be slight hemorrhages from the arteries or from the veins, and here and there yellowish-white plaques or masses somewhat similar to those observed in the retina in association with kidney disease or diabetes. Owing to the rapid onset, however, the opportunity of making an early ophthalmoscopic examination does not frequently offer, for within a few hours after the patient has first noticed the dimness of vision the media may have become so clouded as to make such an examination impossible.

In a day or two (or even earlier) after the first symptoms, congestion of the conjunctival and ciliary circulation will be noticed and some edema of the conjunctiva (chemosis) will be present. The iris will be sluggish to light or immobile, and an ophthalmoscopic examination will show only a faint reddish or grayish pupil reflex.

By this time the vision will have fallen so that the patient is barely able to distinguish the light. A deep-seated pain, possibly radiating to the side of the head, may be an early symptom, to increase with the progress of the disease. In certain cases, particularly of the milder types, the pain may be insignificant or even absent entirely. As the inflammation increases the edema of the conjunctiva becomes more marked so that a fold of the membrane protrudes between the eyelids. The eyelids themselves become edematous and so swollen that it may be difficult to separate them sufficiently to view the eyeball. The tissues of the orbit are also distended with the inflammatory edema, so that the eyeball is pushed forward in a state of exophthalmus and its movement is limited.

If the case is seen for the first time in this stage, the physician may at first glance think he is dealing with a case of abscess from orbital cellulitis, but the chemosis and the impossibility of getting a red pupil-reflex with the ophthalmoscope should prevent this error. The tension of the eyeball is increased from the products of inflammation within it, and the eyeball may be exquisitely tender to pressure.

The iris becomes discolored and adherent to the lens with synechiae. Pus appears in the anterior chamber and the cornea becomes cloudy and opaque. The pain becomes intolerable, and finally the pus in the eyeball escapes through an opening in the sclera, which has softened and ruptured usually at the point of insertion of one of the extrinsic muscles; or the cornea may slough and thus allow the escape of the contents of the abscess.

With the opening of the eyeball the intense pain is relieved and the severe inflammation gradually subsides after the extrusion of the contents of the bulb. Then follows a gradual contraction of the sclerotic and what remains of the other structures, until the shrunken mass bears little resemblance to an eyeball. This is the condition of phthisis bulbi.

MILDER CASES

In milder cases the pain may be much less intense, the edema and exophthalmus much less noticeable, and the cornea and crystalline lens may remain clear so that the physician, with an ophthalmoscope, or even without it in a suitable light, may see in the vitreous chamber not far back of the lens a yellowish mass of purulent exudate. Such cases may not terminate in rupture of the globe, but as the inflammation subsides, the exudate organizes and ultimately after months or years the eyeball gradually shrinks, leaving the condition of atrophia bulbi (Case 2). The eye is totally blind and from the pupil, which is immobile, though frequently partially dilated, is given back a whitish reflex.

To such cases is given the name "pseudoglioma." Such a condition is occasionally seen in young children after some infective process, notably after meningitis, and it simulates glioma of the retina so strongly in some cases, especially when the history is indistinct, that a diagnosis is difficult.

ETIOLOGY

Metastatic ophthalmia may develop in the course of various forms of pyemia.

According to a classification of Axenfeld,[1] who in 1894 studied 166 different cases, it occurs most frequently in puerperal pyemia, 76 of his cases being of this kind. Surgical pyemia furnished 60 cases, and cryptogenetic septic pyemia 30 cases.

It may also develop in the course of various infectious diseases, such as epidemic cerebrospinal meningitis, sporadic meningitis, pneumonia, scarlet fever, measles, typhoid, diphtheria, cholera, variola. It has even been reported as occurring in mild form after furuncle from staphylococcus infection. Because of the more widespread use of antiseptic methods in midwifery and surgery, the puerperal and surgical cases are much less frequent than formerly.

In the development of metastatic ophthalmia the specific organism that excites the inflammation probably lodges in some of the narrow capillaries of the retina or chorioid included in small septic emboli. Virchow[2] was the first to discover such emboli and so to explain the metastatic nature of the disease. These small embolic masses promptly light up an inflammation of the retina which is the cause of the early disturbance of vision.

The question whether the retina or chorioid is first affected by this embolic inflammatory process is a debated one. Axenfeld holds that in bilateral cases the retina is first affected, whereas in unilateral cases the uvea is also primarily involved. This is certainly a fine distinction that it would seem difficult to prove. Certainly after the inception of the trouble, the circulation of the eye is interfered with by the formation of thrombi in both the retinal and chorioidal vessels. This explains the early appearance of the edema of the conjunctiva and the tissues surrounding the eyeball. In puerperal cases the micro-organism that most frequently causes ophthalmia is the streptococcus. These organisms cause stoppage of the fine capillaries with relative ease.

The ophthalmia begins most frequently in the first or second week after the puerperal infection, but it may come on after the patient is apparently well and as late as the seventh week after the infection. In cases in which it is so long delayed there is often ulcerative endocarditis which may account for the infection of the eye. Indeed, endocarditis occurs in more than half of the puerperal cases having a fatal termination.

According to Axenfeld's table of sixty-nine cases of metastatic ophthalmia occurring in puerperium, forty-two were bilateral; both eyes were affected either at the same time or with an interval of only two or three days. In four cases this interval was longer, in one of them the second eye being affected twenty-four days after the first.

The number of cases of metastatic ophthalmia occurring from surgical pyemia is much smaller than before the days of careful antiseptic technic. Cryptogenetic infections, however, still furnish a considerable number of these cases.

The pneumococcus, typhoid bacillus, colon bacillus and influenza bacillus, as also the *Meningococcus intracellularis* have been found in eyes affected with metastatic ophthalmia; but in cases occurring in connection with the various infectious diseases that have been mentioned before, measles, scarlet fever, diphtheria, cholera, etc., there is usually a mixed infection and probably some of the pus-forming organisms are the real cause of the suppuration in the eye.

A peculiarity in cases developing in the course of meningitis is, that they are of a much milder character than those caused by other infections. It is this class that frequently furnish in children the cases of pseudoglioma.

PROGNOSIS

An important part of the subject is the prognosis, not so much for the eye, which is usually lost, but for the life of the patient who suffers from metastatic ophthalmia. As to the eye, even if it escapes destruction from the suppuration, it is usually totally blind. A few rare cases have been reported in which a small degree of sight remained after the subsidence of the inflammation. Usually, if the patient survives, he has a shrunken, useless eyeball, which may have to be removed.

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[1] Axenfeld: Arch. f. Ophth., [illegible] No. 3, p. 1.

[2] Virchow: Ueber kapillare Embolie, Arch. f. path. Anat. u. Physiol., ix, 307.

The danger of sympathetic disease of the sound eye is not so great in phthisis bulbi, that is one in which the contents of the ball have been extruded in the suppuration, as in atrophi bulbi, in which the ball has not ruptured, but in which the contraction of the organized exudate causes shrinking of the bulb. These latter may be dangerous and should be removed.

As to the life of the patient, the prognosis, in case of metastatic ophthalmia occurring in any infectious disease is grave, especially so if it is bilateral. Many patients die. The mortality ranges from 21 per cent. in the unilateral to 85 per cent. or more in the bilateral cases.

In puerperal pyemia, the mortality is even higher than that given, being from 55 to 65 per cent. for the unilateral and 85 per cent. or more for the bilateral cases. In the unilateral cases death occurs in from one to eight weeks after the onset of the ophthalmia, whereas in the bilateral cases it occurs earlier, sometimes soon after the involvement of the second eye. In surgical pyemia the mortality of the bilateral cases is also great; 75 per cent, while 50 per cent. or more of the unilateral cases succumb. The mortality is less in cases in which metastasis occurs in the eye alone; but if metastatic processes exist in other organs as well it is great, even as high as 85 per cent. In cryptogenetic septic cases the mortality is about the same when the ophthalmia is bilateral, but is lower when unilateral, recorded cases showing about 83 per cent. for the former, and 33 per cent for the latter.

Metastatic ophthalmia therefore is of serious prognostic import, in any infectious process, and would seem to be an index of the general infection.

TREATMENT

Usually little can be done in the way of treatment, once the infection has occurred, except to alleviate the suffering of the patient. Hot compresses, cocain applications and leeching the temples may give some relief. When it is clear that pus is in the eyeball and that panophthalmitis is inevitable the eyeball had better be incised to allow drainage. Evisceration of the contents of the globe may be done at the same time or later, according to the condition of the patient. The question of enucleation of the shrunken eyeball will have to be considered at a later time if the patient survives.

We have reason to hope that vaccine and serum therapy, applied early enough, may be of benefit in some of these cases.

ABSTRACT OF DISCUSSION

Dr. Oscar Wilkinson, Washington, D. C.: In regard to Dr. Wilder's third case, while there is little doubt that it was a case of metastatic ophthalmia, there is grave doubt that it was due to streptococcus, for a well-developed streptococcus infection in the vitreous would undoubtedly lead to blindness. The inflammation in the vitreous was possibly due to the toxin from the diphtheria. Pus-forming germs would not ordinarily leave an eye in a healthy condition when they had been sufficiently numerous and well organized to obscure vision. I doubt seriously that any pyogenic metastatic eye ever recovers after vision has been reduced to the perception of light. The inflammation from the meningococcus and several other of the milder and less active bacteria would not be likely to cause so much damage to the eye. It is a well-known fact that metastatic ophthalmia is a grave symptom usually found in cases of general pyemia, and as pointed out by Dr. Wilder, when both eyes are affected, the prognosis is ominous. It is quite probable that we sometimes have slight inflammations of the chorioid which are not sufficiently developed to attract attention, owing to the serious illness of the patient at the time, and it is possible that even pyogenic organisms might be thrown into a vessel of the chorioid without developing into a serious abscess. When this class of bacteria develop sufficiently to cause blindness, we would have grave doubts of the recovery of the vision. We are indebted to aseptic surgery and to aseptic accouchement for the decline in the number of these cases. By properly attacking the foci of infection and eradicating this, we are enabled to prevent a large majority of these cases, and a fatal termination which was formerly so frequently associated with puerperal conditions, and particularly those cases in which metastatic ophthalmia was present. The fact that metastatic ophthalmia is associated with some general infection shows that our first duty is to find the cause of the infection and relieve that as soon as possible, either by surgery or serums, or by both. Serums and vaccines really offer the only hope in the way of treatment, outside of combating the general conditions with tonics, and attacking the foci of infection with the knife and antiseptics. I regret that Dr. Wilder did not go into more detail regarding this form of treatment and its application and usefulness. The use of the proper serum is indicated in all cases of metastatic ophthalmia where bacteria are found in the blood, or even in cases in which there are no bacteria found, where there is a focus of infection as in the second case discussed. Sufficiently large doses given intravenously as the improvement or condition of the patient might indicate would no doubt prevent the fatal termination in some of these cases, even though the eyes might be lost. In cases which are sufficiently chronic, the use of both serums and vaccines is advisable. Vaccines are effective as a preventative, when an early diagnosis of the general infection which caused the metastatic ophthalmia has been made, and by its use, it is possible to prevent many of these cases. While it may not always be necessary to use autogenous vaccine, which is usually the most effective, it is necessary to discover the bacteria at fault and to administer a vaccine accordingly. If seen early enough, in mild cases, it is possible to prevent the disease, particularly if the doses given are large enough. The weakest point in the vaccine and serum therapy is the timidity with which it is given.

Dr. Allen Greenwood, Boston: About five years ago there occurred in Boston an extremely severe epidemic of cerebrospinal meningitis, which increased in severity as the cases became more frequent, and then subsided, so that during the whole year we had a great many cases at the Boston City Hospital. Dr. Wilder speaks of meningitis causing metastatic ophthalmia of mild character. This may be true, perhaps, of some forms of meningitis in children. In the epidemic in Boston it was not true. The cases of metastatic ophthalmia were extremely severe. Most of the patients with metastatic ophthalmia died, but the severity was marked. One man recovered, with a complete phthisis bulbi in the involved eye. At that time Dr. Councilman called attention to the great prevalence of optic neuritis and chorioidal trouble in meningitis, and practically every patient who entered the hospital with cerebrospinal meningitis showed disturbance of the optic nerves. There is a question, perhaps, whether these cases should be called metastatic ophthalmia, or whether there was a direct extension of the infection from the fluid of the sheath, into the eye itself. In the cases I saw, the eyes were lost quickly and with one exception the patients who showed ophthalmia died from the cerebrospinal meningitis.

Dr. Casey Wood, Chicago: In January, 1894, I was consulted by a woman who exhibited one of the rare cases of metastatic ophthalmia just referred to by Dr. Wilder, in which, although there was a bilateral, septic panophthalmitis and vision was completely lost in both eyes, the patient survived. She was 34 years of age and apparently free from organic disease. Of her four pregnancies, only one had a living issue, a child in poor health. Of three other conceptions one ended in a miscarriage and two others in still-born children, each at about the seventh month. The first of these premature labors was accompanied by an albuminuria and followed by a mild attack of puerperal fever. Three days before the termination (at seven months) of her last pregnancy, she was seized, on retiring, by a violent headache which continued during the night and was accompanied by "cracking" noises on the left side of the head and face. When morning came, the patient could not see out of the left eye, and the lids were much swollen. During the day the eyelids on the right side began to swell, and later on, the vision was also extinguished in the right eye. The edema of the parts increased until the eyeballs protruded between the enormously swollen lids. When I saw her six weeks after the trouble began, the patient was still weak and had a rapid pulse, although her temperature was normal and she had no albuminuria. There were no lesions of the heart, lungs or reproductive apparatus discoverable on an examination by a competent surgeon. The patient presented an ocular picture that I have never forgotten. The skin about the whole orbital region on both sides was enormously swollen and thickened, the lower lids were everted and could with difficulty be replaced, while the conjunctiva, both ocular and palpebral, edematous and covered with pus, hung in folds over the margins of the lids. The cornea had almost entirely sloughed off, and from the gaping openings the pus was still oozing. Some attempt at repair had been made on the right side, where lens matter was still adherent to some partially organized scar tissue. A careful examination of the case disclosed no septic foci except those established by the puerperal state in a probably luetic subject; hence, I think we were justified in regarding the process as a bilateral panophthalmitis due to a septic embolism of uterine origin. A year after the accident the patient was still living; in fair health, but with much shrunken eyeballs. This case was reported, both in the *American Journal of Obstetrics*, 1894, and in the *Philadelphia Medical News*, April 27, 1895.

Dr. Edward Jackson, Denver: I recall the cases of two women suffering from panophthalmitis of one eye due to pneumonia. In one case the eye was left blind, but not much shrunken. There was no bacteriologic evidence. The other patient came into the hospital for a comparatively light pneumonia, with slight pleurisy. About the third day, the eye became severely inflamed, and burst, I think, on the third day of the ocular inflammation. The pus from the interior of the eye was loaded with influenza bacilli in pure culture. The patient then did well in a general way for ten days, at the end of which time she developed an acute endocarditis and died after being in the hospital about three weeks.

Dr. Adolf Alt, St. Louis: I agree that in cerebrospinal meningitis the infectious process simply creeps down into the eye by way of the intervaginal space. I have had a few cases in which I found this to be true. We are not dealing with a metastatic affection, but with an extension of the meningitic process through the intervaginal space down into the eye.

Dr. W. H. Wilder, Chicago: I do not wish to give the impression that, because the streptococcus was found in the tonsil of the patient that recovered, therefore it was responsible for the inflammation in that eye. The presumption is that in this last case the infective agent was really the diphtheria bacillus, and that probably the prompt administration of antitoxin had something to do with checking the process in the eye. If this is true, and it was really a case of metastatic ophthalmia, which was affected by the prompt administration of antitoxin, it holds out the hope that, if we can find the organism causing the trouble and administer the proper serum or vaccine, we may hope to avert some of these disastrous cases and conserve a degree of sight. That this third case may have been due to infection with the diphtheria bacillus is not unreasonable. We can do nothing but presume in this case, because we could not examine the media of the eye for the organism, but the case presented all the clinical features of metastatic ophthalmia.

PHLYCTENULAR OPHTHALMIA AND EPISCLERITIS *

A STUDY OF THE BEARING OF THE NEWER RESEARCH ON THEIR ETIOLOGY AS THE BASIS OF A SCIENTIFIC THERAPY

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Primarily, two views are possible as to the etiology of these lesions.

A. They may be dependent on infection from without—ectogenous bacterial invasion.

B. They may be endogenous. As to the endogenous theory, several possibilities obtain:

1. They may be malnutritional in origin or due to autointoxication.
2. They may be endogenous infections.
3. They may be irritative effects of bacillary fragments.
4. They are possibly the result of anaphylactic reactions.

ECTOGENOUS THEORY

It may scarcely be claimed by students of the subject that these are diseases of bacterial invasion from without. Bacteriology has failed to disclose any consistent evidence of such invasion, and pathologic histology shows no break in the conjunctiva or site of ingress of the infector primarily.[1]

It is of interest incidentally that observers have found the histology identical as between episcleral and phlyctenular nodules,[1] namely, a conical area of roundcell infiltration. These nodules resemble but are not identical with tubercle. Of course, they are not vesicular, as the name implies. The pathology presents nothing akin to the herpetic eruption claimed by some as its prototype.[2]

ENDOGENOUS THEORY

One comes quickly then to the consideration of the endogenous origin of the lesions, and the nutritional point of view becomes at once prominent.

Malnutrition Theory.—While simple malnutrition may be shown to be a primary factor in lowering natural resistance to infection, it seems hardly proper with our present knowledge to consider it a primary cause of lesions of this type. This may be shown later.

Under this head may very properly be considered part of the most excellent and convincing contribution of Professor Straub on specific body weight in relation to scrofulosis; such a part as concerns the discussion of nutrition.

Influence of Lime Salts.—Straub[3] and his pupil, Wiemer, took the specific weight of children suffering from phlyctenular ophthalmia as compared with healthy children. They submerged these children in tepid water except for the head, measured the quantity of displaced water and calculating this and the estimated displacement of the head, determined the specific volume of the children. This table I take the liberty of introducing here, and from it will be seen at a glance that a great majority of the scrofulous children have about the specific weight of water, whereas the normal children have a higher specific weight. This lighter weight may quite justly be ascribed, as Straub claims, to the variation in the density of the bones due to deposit of the lime salts in normal children and a lack of such deposit in scrofulous types.

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* Because of lack of space, this article is abbreviated in The Journal. The complete article appears in the *Transactions* of the Section and in the author's reprints.

[1] Parsons: Pathology of the Eye, 1904, i, Part I; for Bacterial Observations see pp. 78, 270 *et seq.*

[2] Bruns: Phlyctenular Ophthalmia and Its Etiology, The Journal A. M. A., Sept. 21, 1912, p. 1002.

[3] Straub: Oxford Address, Ophthalmoscope, 1912, x, No. 11.

Exception may properly be taken to the interpretation which Straub places on these estimations, at least until such time as it may be shown whether these children may not be primarily lime-starved. It is surprising how little attention is given by practitioners, or even dietitians, to the lime-salt content of the diet in infancy and childhood.

Consideration of malnutrition is of first importance, since association of it with phlyctenular ophthalmia is at least always evidenced. Though fundamental, it cannot be the only point of view, since most children with malnutrition have not phlyctenular ophthalmia, even though the contrary association may be shown.

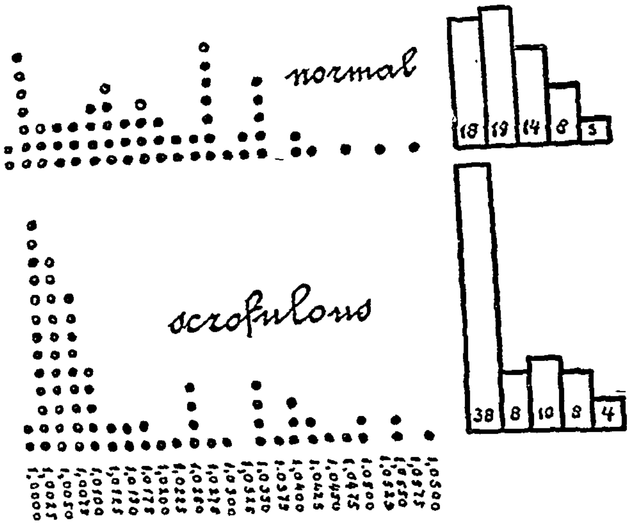

Chart 1.—Specific weight of scrofulous children.

Auto-Intoxication Theory.—So-called auto-intoxication, more properly enterotoxemia, enters into the discussion of malnutrition. The researches of Cannon[12] on the mechanics of digestion, by the combined bismuth meal and Roentgen ray, have revolutionized the ideas of scientists on this form of auto-intoxication and place it definitely under the head of a stasis. As now proved enterotoxemia is due, not to infections of the mucosa *per se*, but to retention of the materials by stasis, the incubation of a polybacterial flora leading to the formation of many varieties of poisons. Further consideration of this will be taken up specifically in the discussion of the anaphylaxis hypothesis.

Notwithstanding the fact that these points with reference to the nutritional side are fundamental, they may more properly be classed as predisposing causes, for it has never been proved that a definite lesion, such as we have under consideration, could be produced primarily by errors of nutrition. Something else is necessary, something of an infectious or specifically irritating nature. And so we come to endogenous infections.

Endogenous Infection Theory.—So the puzzling nature of the question has led, as you know, to the assumption of metastases from some hidden focus in the body, and Straub takes such a *latent* tuberculosis as the morphologic substratum of scrofulosis, the result of a preinfection with tubercle bacilli, unhealed and still containing living bacilli. The benign nature of this metastatic scrofulosis is taken to be due to an attenuation of the bacilli combined with a partial bacterial immunity which has been developed through the preinfection, one or both. These lesions do not develop into genuine tuberculosis because either the bacillus is attenuated or the spontaneous immunity is controlling. On this theory there must, accordingly, be many grades of virulence of the organism and much variation in the antibody formation—endless shades of toxic and infective and antibody potency.

This lack of development of full tuberculous lesions secondarily was the fundamental discovery of Koch, who undertook superinfection on guinea-pigs as long ago as 1891, but produced only quick-healing ulcerations without even involvement of the neighboring lymph-nodes. Hamburger[13] has followed this out further and concluded that it is a sign of immunity dependent on hypersensitiveness, or allergia, the organism immediately repelling the infection by the quick reaction of "natural inflammatory healing forces." Römer[14] has carried us still further and proved that even this second infection does little to extend the primary lesion.

Two possibilities are offered to explain the negative finding of tubercle bacilli in these lesions: (1) imperfection in staining technic; (2) their quick destruction after infecting. Quite recently Wegelin,[15] in a study of supposed healed calcareous tuberculous lesions, was able to demonstrate tubercle bacilli of low virulence by a special process of staining, namely, the alkaline hypochlorite method, so that it remains to be seen whether one might more often demonstrate tubercle bacilli in these lesions by employing more appropriate methods of staining. The conclusion is also justified by this and by the work of Rabinowitsch and Schmitz that the tubercle bacilli in most of the so-called healed tuberculous lesions, even the calcareous or encapsulated ones, are still viable.

Bacillary Fragment Theory.—Klingemüller[17] has claimed that these tuberculids, which might be taken to be akin to phlyctenas, are the result purely of toxic actions, and he cites the fact that tuberculin (which is the protein of dead tubercle bacilli) may be filtered through Berkefeld filters and, although assumed to contain no bacillary particles in consequence, the filtrate will still produce not only tuberculids but true tuberculous tissue. Siegrist[18] has produced anatomic tubercles by the conjunctival reaction of tuberculin.

In the early experiments the tuberculins employed were not true solutions and hence not free from fragments of tubercle bacilli. Previously it had been many times proved that pulverized tubercle bacilli could produce miliary tuberculosis, and the tubercles were thought by Pick and Daels to be due to bacillary fragments. Zieler[19] later clearly showed that these tubercles could be produced not only by filtered-out tuberculins, from which it was assumed that the microscopic fragments were entirely absent, but even by dialyzed tuberculin, which would supposedly contain only the dissolved substance.

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[12] Cannon, W. B.: The Mechanical Factors of Digestion, 1911.

[13] Hamburger: Beitr. z. Klin. d. Tuberk. (Brauer's), 1909, xii; section 3, Ueber Tuberkuloseimmunität.

[14] Römer: Beitr. z. Klin. d. Tuberk. (Brauer's), 1908, xi. section 2, p. 109.

[15] Wegelin: Cor.-Bl. f. schweiz. Aerzte, 1910, xl, 913.

[17] Klingemüller: In Wolff-Eisner's Frühdiagnose und Tuberkuloseimmunität, 1909, ed. 2, p. 130.

[18] Siegrist: Therap. Monatsh., April, 1908.

[19] Zieler: München. med. Wchnschr., 1908, No. 32, p. 1685.

Especially is attention directed here to the so-called micellae of Nägeli—for the ultramicroscope reveals these dialyzed tuberculins as molecular aggregates. These micellae are in harmony with the accepted chemistry of colloids, for even in the dialyzate of colloids[20] ultramicroscopic bodies are present. It becomes a matter then merely of relative fineness of molecular aggregates. In this way have been explained the exanthems which we so often see after the administration of serums,[21] the minute ultramicroscopic aggregates of the proteins or albumins of alien serums being deposited in the form of metastases over the body.

Possibility of Other Organisms.—If then the production of lesions such as phlyctenas may be explained and proved possible by even ultramicroscopic metastases of bacillary protein from tubercle bacilli, may the same be proved for other organisms? On this one may only predict from still unfinished observations; similar possibilities may be shown for the bacillary protein of streptococcus, perhaps for others also.

Anaphylaxis Theory.—I take up briefly, then, the last hypothesis offered to explain the existence of these lesions, that is, that they are due to an anaphylaxis.[22] Any anaphylactic—better allergic—reaction depends on presensitization and, in this instance, we may say also presensitization of an area. An anaphylaxis hypothesis, therefore, does not explain primary causation, but is of infinite importance in the production and recurrence of the lesion after infection, as shall presently be shown. This seems to be the point of contact by which this theory may be linked with the others to complete the etiologic chain.

The study of tuberculosis must first be made because of the greater probability of its etiologic importance through force of its extreme prevalence, a point which is absolutely fundamental to the discussion.

The studies of Nägeli[23] and Burckhardt[24] show[25] that practically the whole race has tuberculosis in an active or latent or cured state, that practically all children gain this infection before the age of 12 to 15. But as the mortality ratio is probably not more than 15 per cent., it is obvious that at least a relative immunity is obtained in the other 85 per cent. This relative immunity is indicative either of the low or diminishing aggressivity of the bacillus, or of the easy though slow evolution of antibodies, or both.

It seems, then, that at least preinfection with tubercle bacilli is capable, as is tuberculin in like manner (Case 1), of generating such a lesion as a phlyctena or an episcleritis, and one would seem justified in stating that by similar means a streptococcus would cause such a lesion as episcleritis. But it does not seem that such a lesion could be produced primarily by malnutrition or auto-intoxication independent of a preinfection.

Acknowledging that tuberculosis would most likely be grafted on a subject of malnutrition or of auto-intoxication, in what way may the problem differ when we have malnutrition or auto-intoxication subsequent to the evolution of a tuberculous focus? Here enters the influence of allergic reaction, and its study should help clear the field, and should satisfy the claims of the believers in the anaphylactic nature of such diseases; for while products of vicious metabolism or auto-intoxication may not cause lesions, their influence on the reactivation of infected foci is more open to proof.

Our point of view must, therefore, be changed in the light of these modern conceptions,[27] for they are in harmony not only with accepted theories of allergic reactions but fulfil the proved doctrines of the side-chain theory of Ehrlich and add further proof of the interrelation or similarity of hypersensitization and immunity.

So also must be weighed the importance of recognizing the local nature of this sensitization, in addition to its general character. These areas, once involved, are supersensitized and become the most likely areas for involvement; hence recurrences are prone to become manifest.[28] Certain of these substances are sufficiently attuned to the endotoxins of the infecting bacteria to act as they would in the blood-stream, and by irritation of the foci may lead to reactivation. This I take as the chemopathologic substratum of the allergic or anaphylactic reaction, the cause of the lighting up of the phlycten, or the episcleritis, and the explanation of the bearing of anaphylaxis on the etiologic problem. These substances operating by reactivation of a preinfection may excite further metastases, but they may not primarily cause the lesions, since they are not themselves specifically infective. In this way may be explained the idiosyncrasies to strawberries (Case 2) and other organic acids, the autogenic toxins involved in fatigue states, those of enteric origin, and all the array of causes that have hitherto been thought to influence and which always accompany these ocular manifestations.

Determination of Cause.—In the determination of the probable fundamental factor in a given case before us we have first to consider, because of its universal prevalence, the probability of an underlying tuberculosis. It is the great possibility of variation, not only in the attenuation of the infector but in the variability of the antibacterial immunity present, which makes the problem so complex. Studies of the opsonic index have been made and negative phases to tuberculosis have been found to precede the evolution of a phlyctena. This may be accounted for by auto-inoculation from a reactivated focus. The appearance of the phlycten thus might properly be termed an "auto-Calmette." An opsonic observation of many cases, however, has convinced me that this negative phase is not present in the majority of cases, and obviously would only occur in cases in which the auto-inoculation was considerable. In the determination of the presence or absence of scrofulosis it would seem, as I have pointed out before—the result of frequent observation—that a variable opsonic index, not as to whether it is low, but whether it is greatly variable, points to the occasional auto-inoculation and the presence of an active focus somewhere in the body (Case 3). I take this to be a better barometer than a continuously low index.

It must be apparent to an unbiased observer that no advantages accrue from a large diagnostic dose over a minute dose therapeutically administered but giving a diagnostic reaction; for a therapeutic administration of tuberculin which has produced a reaction has established a diagnosis of sensitiveness, and that is the aim of the test. Such a diagnostic measure may indeed serve both for diagnosis and for control of therapy, a guide to subsequent administration. The second test of reaction, and one which Sahli recommends, is the examination of the leukocyte count for an increase (Case 4). The leukocyte reaction is thought to offer the mildest reaction possible and is the one which I employ for therapeutic guidance.

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[20] Ricketts and Dick: Infection, Immunity and Serum Therapy, Chicago, American Medical Association, 1911, p. 243.

[21] Sahli: Tuberculin Treatment, 1912, p. 115.

[22] Verhoeff: Internat. Cong. on Tuberculosis, Washington, Sept. 28, 1908.

[23] Nägeli: Ueber die Häufigkeit, Lokalisation und Ausheilung der Tuberkulose, Virchow's Arch. f. path. Anat., 1900, clx, 426.

[24] Burckhardt: Ztschr. f. Hyg., 1906, liii, 139.

[25] Autopsies of our cities when carefully made with that intent disclose confirming evidence of these researches.

[27] The speculative nature of these reactions must of course be acknowledged. The problem is most complex because the chemistry of these bodies is not known. For the present its solution rests largely on physiopathologic reactions. Certain conclusions are, however, justified by these studies, pending chemical verification.

[28] In the exhibition of several hundred therapeutic inoculations of many vaccines I have satisfied myself that the areas of inoculation remain sensitized for a considerable period of time and many times become irritated when reinoculation is employed in other regions. This to my mind is akin in a small way to what happens to the phlyctenular area.

I accept the Wolff-Eisner theory of lysin formation as the cause of the tuberculin reaction, and the fact that an autogenic immunity is adequate to preserve life in 85 per cent. or more cases shows at least that a sustained resistance is established, a condition I propose to call "defensive equilibrium." Now, Wolff-Eisner assumes the existence in the tuberculous infected macro-organism of amboceptors or lytic bodies, and bases his theory on the well-known allergic reactions which follow the injection of albuminous substances, parentally, namely, the formation of albumin-dissolving substances, albuminolysins. After the first injection they are present in the circulation and the macro-organism is sensitized to subsequent injections. These lysins are formed in excess of the requirement of the first injection. (See Vaughan and Wheeler's theory also[31].)

When tuberculin is inoculated in a case in which there has been a preinfection with tuberculosis, there is a speedy cleavage due to the presence of the lysin, the formation of tuberculinolysin, which itself forms, first, primary lytic antibodies, leading to attenuation and destruction of bacilli acting directly (bacteriolysins), then secondary antitoxic antibodies which neutralize the toxicity of the lysinized tuberculin, as well as the lysinized tubercle bacilli themselves.

Tuberculin (injected) + lysin (already in body) = first, the formation of tuberculinolysin, increased toxicity, leading secondarily and later to the formation of antibodies antitoxic thereto.

Now, if body-made bacterial protein produces such manifestations as phlyctenas and episcleritis, why does not ectogenic tuberculin produce the same manifestations? The answer contains both the proof of the Wolff-Eisner theory and the strongest possible argument for small dosage. An irritation shown in the foci or in the production of a phlyctena not only furnishes the proof of the Wolff-Eisner theory but shows that the dosage has been too large, has been greater than the serum content of antibodies can control, has done temporary harm.

Hence, since the toxin formed by the tuberculinolysin is the cause of the reaction, any excess of tuberculin would produce a reaction and that reaction would evidence lack of antitoxic antibodies in the serum. For that reason, as will be stated in connection with the therapy, only reactionless therapy may safely be employed.

THERAPY

General Therapy.—Prof. William F. Norris inherited from Von Graefe the treatment of phlyctenular ophthalmia[32] which was employed in his service at Wills Eye Hospital in the early days of American ophthalmology. This treatment is still in vogue in the clinic of his successor and is a beneficent example of empiricism in the specialty. It was based on careful observation of therapeutic effects. I have seen too many patients cured by it to believe that it was anything but scientific, or to minimize the importance of the local, general and gastro-intestinal therapy. It is not now out of line with scientific findings, albeit its advocates could not have appreciated its scientific foundation.

The treatment consisted in the withdrawal of all cane-sugar combinations, all acids, tea and coffee, and the sterilization of the intestinal tract by absorbing doses of calomel continued over many days; they substituted fresh air, nourishing, bland diet—a good basis for the natural immunizing treatment of to-day.

My therapy since these days of tutelage has been this treatment amplified by the early realization that what must be sought is what we have always termed an alkaline dietary. To that end for twenty years my practice has tended toward lower and lower protein and a non-acid[33] content of the diet. Latterly has been proved the necessity for protein in the anaphylotoxin from which the allergia are produced. The value of this low nitrogen intake has had latter-day confirmation by scientific researches on nutrition, as Chittenden[34] on the physiologic, and Metchnikoff and Combe[35] and many others on the auto-intoxication side. Further help has been offered by attention to the lime content. Improved, too, have been the means of gastro-intestinal sterilization, speaking now from the prophylactic side in the management of these sensitized subjects. These have been afforded by the work of Combe,[35] Metchnikoff, Von Noorden,[36] and the classical researches of Cannon,[12] above mentioned.

Specific Therapy.—Quite compatible with this general management, but far more fundamental for the immediate attack, is the specific therapy, and with no disparagement of the former it must be said that the latter justifies itself in the immensely shortened duration of the attack (Case 5, also other appended cases).

Freed from the empirical, there should be no hesitation in the immediate application of both this general and the specific therapy to the case in hand. One who does not appreciate the fundaments and clearly comprehend the theories of specific reactions should not undertake the use of immunization treatment in any department.

Reactionless Therapy.—In the beginning of the consideration of specific therapy, which may only be touched, I accept the dictum of Sahli, of Wolff-Eisner, and of Wright, evidenced by their many writings, for small dosage—for reactionless therapy. Wright has led in this practice, and one finds in the successful therapeutic inoculation methods of Wolff-Eisner and Sahli an extension of Wright's valuable work.

I confess that one has great difficulty in restraining oneself from obtaining a grossly visible reaction in a therapy of this type, but one is repaid for such restraint by the valued and many times ideal results. There is small solace for the physician in seeing a reaction if the patient is thereby made worse.

Many precautions are necessary for successful employment of tuberculin, but into these I may not go. In my observations all grades of reaction have been manifested—local alone, focal alone, or general alone, or two, or altogether, or all absent with only the white cells increased; and this great variability in the reaction, not only as between patients, but on different occasions with the same patient, would seem to indicate the great variation in lysin activity or complement, possibly a rise and fall in them, as has been shown in so many other bodily functions.

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[31] Vaughan and Wheeler: Jour. of Infect. Dis., June, 1907.

[32] Norris and Oliver: Text-Book of Ophthalmology, 1893, p. 328.

[33] It is not generally known that subjects of enterotoxemia are idiosyncratic to organic acids of all kinds, but such is the case, though the reason for it is not clear.

[34] Chittenden: The Nutrition of Man, 1907.

[35] Combe: Intestinal Auto-Intoxication, 1908.

[36] Von Noorden: Intoxication Proceeding from the Intestine, THE JOURNAL A. M. A., Jan. 11, 1913, p. 101.

Other, better controls of this therapy than the white blood-count may be forthcoming, but we should at present be content to produce increase in the leukocytes in twenty-four hours to the exclusion of other reactions. This satisfies the call for evidence of effect, for the present at least.

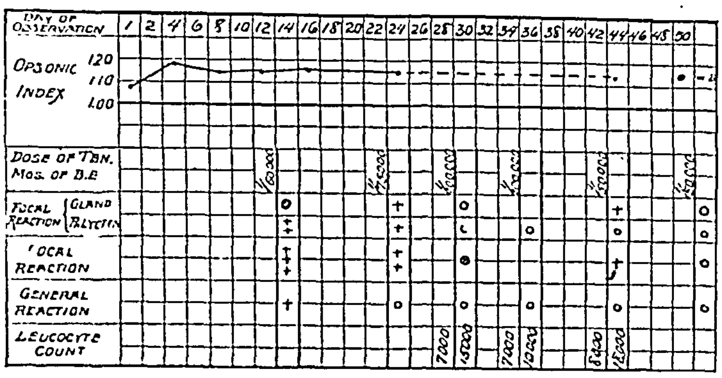

Chart 2.—Opsonic, leukocyte and other reactions described in Case 1. In this and the following illustrations ⊙=doubtful, +=positive and 0=negative.

One who adopts the low dosage can help all cases which may be helped by the therapy; while the large dosage is two-edged and will help a minority to the injury of many subjects.

Sahli has well summed up the question when he says that the effect of physiologic irritation is not generally proportional to the strength of the stimulus but rather depends on a condition of the organ stimulated. Thus, a weaker stimulus often produces a greater effect than a stronger, since the latter may paralyze the function. Confirmatory evidence of this is found in the work of Friedberger and Moreschi.[38]

REPORT OF OBSERVATIONS

Case 1.—Demonstrates occurrence of phlyctena on overdose of tuberculin administered for mastoid pain due to deep subauricular lymph-node involvement. Chart 2 shows also opsonic, leukocyte and other reactions. Patient was a woman aged 46 years. History later disclosed fact of frequent occurrence of phlyctena years previously. Note lack of variation in opsonic index of case which, nevertheless, responded to tuberculin. Also leukocyte and other reactions quite marked. Minute doses employed.

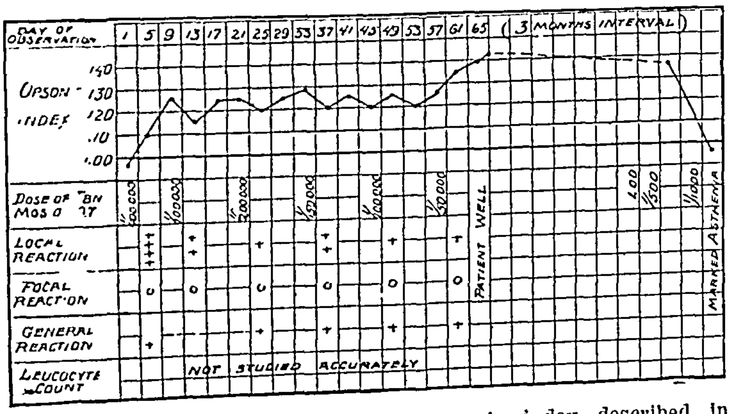

Chart 3.—Variable preinoculation opsonic index described in Case 3.

Case 2.—Man of 26 years. Demonstrates occurrence of phyletena on ingestion of unripe strawberries. Cure by reactionless tuberculin in five days. Patient has observed frequent association of phlyctena with eating of strawberries. Other attacks have lasted two and three weeks. Questionable history of early tuberculosis. Blood not studied.

Dosage first day 1/100 mg., fourth day 1/50 mg. B. E.

Case 3.—Demonstrates variable preinoculation opsonic index in the case of episcleritis cured by tuberculin after all other therapy had been tried and failed. Patient a robust man of 48. Case diagnosed as of probably rheumatic origin and so treated. Seen by Wilder of Chicago and Wilmer of Washington who concurred in diagnosis and treatment. Treatment failed. After seven weeks vision reduced to fingers at 2 feet by cloudy punctate cornea. Blood studied and cure effected and vision restored in twenty-one days by reactionless therapy. Chart 3, opsonic index and other findings. Response to tuberculin immediate.

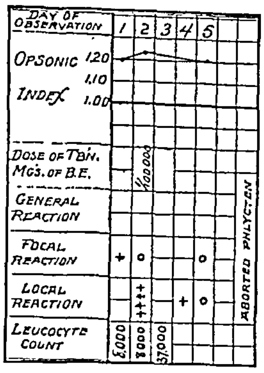

Chart 4.—High opsonic index associated with other marked reactions in abortive case of phlyctena described in Case 4.

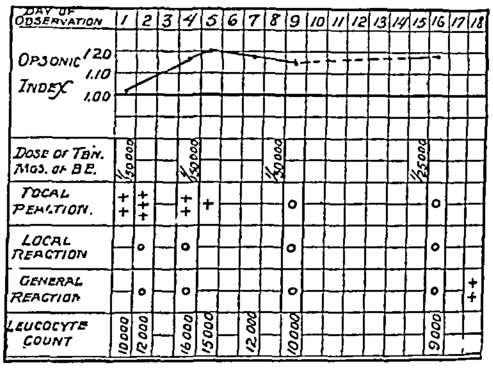

Chart 5.—Quick recovery from episcleritis described in Case 5.

Case 4.—Demonstrates marked leukocyte reaction in abortive case of phlyctena, also marked local and general reactions. Patient girl of 17 years, sister of Patient 2. Later learned history of preinfection. Pott's disease in early childhood. Chart 4 shows high opsonic index associated with other marked reactions.

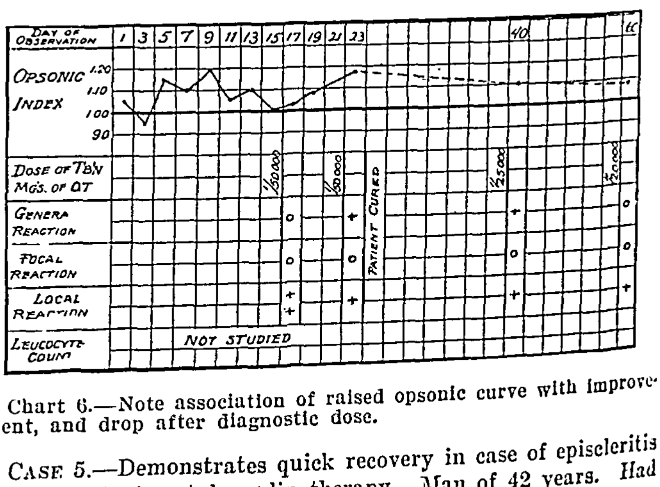

Chart 6.—Note association of raised opsonic curve with improvement, and drop after diagnostic dose.

Case 5.—Demonstrates quick recovery in case of episcleritis from reactionless tuberculin therapy. Man of 42 years. Had many previous attacks of episcleritis which were invariably protracted. Chart 5 illustrates this case.

Case 6.—Demonstrates extreme case of scrofulosis. Girl aged 20. Recurring phlyctenas complicated with deep periosteal ulcer over mastoid. Mother died of phthisis when patient was born. Steady improvement under reactionless tuberculin therapy including healing of ulcer and improved general health. Chart 6 shows association of raised opsonic curve with improvement and drop after diagnostic dose. After two months steady improvement usual diagnostic dose administered by practitioner followed by two usual therapeutic doses leading to perilous asthenia — marked allergic reaction.

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[38] Friedberger and Moreschi: Deutsch. med. Wchnschr., 1906, No. 49, p. 1986

Collectively these observations show the inconsistency of the reactions to which the tuberculous patient is liable, both from his disease and from tuberculin inoculation. Any one of these may be considered a positive reaction since none of them should show in the non-infected. These cases indicate also the possibility of inducing the reactions with minute doses and seem to substantiate the argument for the sufficiency of the employment of such therapeutic inoculations for diagnostic purposes as well.

ABSTRACT OF DISCUSSION

Dr. George S. Derby, Boston: More and more evidence is being presented each year in regard to the etiology of phlyctenular disease and episcleritis which shows that these cases rest on a tuberculous basis. Ninety per cent. of the cases of phlyctenular disease give a positive tuberculin reaction, and 10 per cent. is a small percentage of error for any test of that sort. We do not know why this percentage do not react, but I feel sure probably all of them are tuberculous in spite of the fact that they do not react. A positive reaction to tuberculin shows that the patient is suffering from tuberculosis, while a negative reaction is not so important. If the general physical examination of these patients gives a negative report, it means absolutely nothing. There are often healed lesions of tuberculosis which can not be found. Of course a positive report is good evidence. If phlyctenular disease of the eye rests on a tuberculous basis, it places a large load of responsibility on the ophthalmologist, because it is one of the most frequent diseases we meet in our clinics. It means that each year we see many children who have been comparatively recently infected with tuberculosis, and any tuberculosis expert will tell you that is the time to take tuberculosis patients—when they are young—and it is our duty to take hold of them and follow them up and see that they receive proper, general hygienic treatment; see that they are taught to live properly, and if this is done, they will disseminate the information among others in the community. By following up the cases we shall find active tuberculosis in their families. I have seen children with phlyctenular disease in the hospital, and sending a nurse to the home, found a patient there with active tuberculosis. If the ophthalmologist takes these cases up in the way he should he can aid greatly in the fight against tuberculosis. We are also aiding in the conservation of vision, because, although few of these patients actually lose their vision as the result of phlyctenular disease, nevertheless, frequent attacks are apt to damage the vision and disable the patient industrially to a considerable extent. Every hospital should have some sort of special organization to take care of the cases of phlyctenular disease. I think that they are best taken care of by means of the group method; and one cannot handle them without some sort of a follow-up system, such as a social service department, by means of which these patients can be followed to their homes, and correction made of the faults of living that are found there. It is easy to cure a single attack, but to prevent future attacks is the problem, and that is a much harder one. The use of tuberculin in phlyctenular disease is not often necessary. Most of these patients recover without tuberculin. Even though tuberculin is used, it is often extremely difficult to prevent repeated attacks in obstinate cases. We use tuberculin in Boston in a number of cases, but not in the majority. The use of tuberculin is not all that is necessary; it is not nearly so important as general hygiene. This is also true in tuberculosis in adults. I have used calcium lactate and various dietetic treatments in phlyctenular disease, and have not been very well satisfied, for I have not been able to draw any conclusions from their use. Small doses of tuberculin are preferable in severe ocular tuberculosis because it is not safe to get a reaction or to just fall short of getting a reaction. I have seen one patient treated with large injections, with the purpose of obtaining a reaction and that patient is blind to-day as the result, I believe, of the repeated reactions. Dr. Gamble is quite right in what he says. Many of the patients will recover whether they are treated or not. It is better to inject the tuberculin between the shoulder blades or sometimes in the arm. In cases of special sensitiveness there is one situation better than all the others, and that is described by some as the northwest corner of the buttock.

Dr. Charles N. Spratt, Minneapolis (exhibiting a patient with tuberculous keratoscleritis): This patient showed the characteristic tendency of the disease to relapse. She was seized with terrific pains and redness of the right eye eleven weeks before I saw her, in June, 1911, and examination showed inflammation of the sclera in the upper, outer quarter. I gave 2 mg. tuberculin (T. O.) as a diagnostic dose. This was followed thirty-six hours afterward by a local, focal and general reaction. The symptoms cleared up almost immediately after this diagnostic dose. She was under treatment about nine months, having had no pain after the first week. She has since had one or two exacerbations. I saw her a week or ten days ago for the first time in a year. The eye has reddened in the last few days as one week ago it was white. This is her menstrual period. The hot weather has irritated the eye. The cornea became involved after the sclera had apparently cleared up. There are now several small, dense leukomas with calcification and I believe that these inflamed leukomas are causing the trouble. She received, altogether, sixty-two or sixty-four doses of B. E., as we tried to avoid a reaction. The first dose was one-ten thousandth mg. and it was run up to 2 mg. The question arises as to the size of the dose producing a reaction. I talked with Dr. Hamman in Baltimore, who says it makes little difference whether we use one variety of tuberculin or another, but to avoid reactions. I have been impressed, however, by the fact that improvement immediately followed a diagnostic dose which produces a slight reaction. This has occurred in eight cases of scleritis and keratoscleritis, treated with tuberculin.

Dr. Albert E. Bulson, Jr., Fort Wayne, Ind.: I agree with what Dr. Derby has said concerning the efficacy of small doses of tuberculin, continued over a long period of time. I do not believe that we are justified in giving large doses of tuberculin for therapeutic purposes. The production of antibodies can be stimulated with small doses, and they are safer. I want to commend Dr. Davis for giving the von Pirquet test first. I do not see the necessity of subjecting the patient to the subcutaneous test, previous to the von Pirquet, though I do think that when we want definitely to decide the question, there is nothing equal to the subcutaneous test. The injections should be carried over three tests, giving a small dose first, and the last dose may be anywhere from 7 to 10 mg. to test the possibility of getting a reaction. If a reaction occurs following the first dose, it is well to wait a while and then repeat the test to verify the findings. I cannot quite agree with Dr. Derby as to the value of dietetic and hygienic treatment without the administration of tuberculin. It works well among the poor in cities, who do not have fresh air and good food, but the addition of tuberculin brings about still better results, as has been demonstrated rather conclusively at some noted tuberculosis camps. I have seen quite a number of patients with phlyctenula of the cornea who began rapidly to improve when given tuberculin, and who did not show such improvement on dietetic and hygienic regulations with the usual ocular treatment added thereto. It does not make much difference what preparation of tuberculin is given, if small doses are used. I have used the old tuberculin and the tuberculin emulsion. At present I am using the emulsion in small, but increasing doses, and like it very much. The treatment is administered every five to seven days, and the patient is carefully watched for results. A reaction is not expected or desired, and the dose is diminished if a reaction occurs. The tuberculin treatment is omitted if the patient has more than from three-fourths to one degree of fever.

Dr. S. L. Ledbetter, Birmingham, Ala.: I learned to treat these things before we knew anything about tuberculin, but have used it a little experimentally, for diagnostic purposes. I have been treating these conditions for about thirty-three years, and never had a patient who did not get well. If they all recover without tuberculin I can not see any great necessity for using it. I can recall but two chronic cases. I know one young woman, married, with three children, whom I began treating when she was a year and a half old. This woman had a few recurrences but never had much trouble although her mother was tuberculous. The child never developed any symptoms except the phlyctenules. I only recall one patient whom I have treated who afterward died of tuberculosis. About one out of every hundred develop tuberculosis whether they have phlyctenules or not, so I would not have wondered very much if one or two patients afflicted with phlyctenules had died of tuberculosis. I have never had any great trouble in treating phlyctenula with good fresh air, good food and tonics.

Dr. Mark J. Schoenberg, New York: We have been told that a general and focal reaction after the injection of tuberculin means tuberculosis, but we neglect to give sufficient attention to the counterpart of the question. How can we know that the case is tuberculous when the reaction is negative? I expected to hear this discussed. We know there are cases of lues which give a negative Wassermann, and also cases of tuberculosis, positive in character, which give a negative reaction to tuberculin. Is this the fault of the tuberculin or is it the fault of the patient? Very little is said in the literature about the work done with tuberculin of bovine origin, relating to the pathology of ocular tuberculosis. Schieck in 1911 published an article on tuberculin from bovine bacilli, injected into rabbits. It is much more virulent in the eyes of rabbits than the human tuberculin. Thus we have a range of virulency, and there may be a large range of virulency for human beings. I do not think this part of the subject has been covered at all. In using the intradermal injections of tuberculin for diagnostic purposes, we sometimes meet cases showing hypersensitiveness to the human tuberculin, and we have to change to the bovine, when we find there is no hypersensitiveness to this kind of tuberculin. Another point is the lack of knowledge why some cases do and some do not respond to tuberculin, although both classes of cases have tuberculosis. We know that phlyctenular keratitis and conjunctivitis may be due not only to the tubercle bacilli, but to foci of streptococci and staphylococci. One of the speakers may be right when he said that we are cured with and without tuberculin, so that it may not be due only to the tubercle bacilli. I think the main difficulty in lung tuberculosis is not a pure tuberculosis. Incipient cases are easily cured. The great difficulty arises with those cases in which added infection comes on top of the tubercle bacillus with the staphylococcus and the streptococcus, and the same may be true in ocular troubles.

Dr. Walter Baer Weidler, New York: One year and a half ago Dr. E. S. Thomson, who is the chairman of the scientific work at the Manhattan Eye and Ear Hospital, asked me to make a report on work done in the clinic with tuberculin. This report has been published in the report of the hospital for 1913. I was able to observe twenty or more cases, which included the following conditions: phlyctenular conjunctivitis, episcleritis and scleritis, keratitis, iridocyclitis and chorioiditis. This work has been continued in my service at the hospital and the von Pirquet test alone was depended on for our diagnostic information. Whenever the reaction was positive, we at once proceeded with the injection of tuberculin and the "T E" was always used, and in not a single case in which the von Pirquet was positive have we failed to arrest and cure the condition. The word "cure" is perhaps out of place in connection with work done with tuberculin; as I do not think that we cure such patients, as they are very likely to have relapses and to have the same conditions appear in the other eye. I have not used any other forms of general medication and the local treatment consisted of boric acid and atropin. In all of the cases outside of the hospital, no effort was made to change the diet or the hygienic conditions, as I wanted to test the value of tuberculin without any of the other usual means employed in the treatment of these conditions.

Dr. Melville Black, Denver: Since Colorado has a reputation as a health resort for tuberculous people, it may possibly be of interest to know that we see comparatively little tuberculosis of the eye, either in adults or in children. Many of the people who come to Colorado on account of tuberculosis afterward become the parents of children and it would be but natural to expect, if there is much in heredity, that these children would probably be afflicted with joint and general tuberculosis of some sort, either in early life or later. Yet I think most physicians will bear out my statement that this does not seem to be true. Of course we see tuberculosis of the eye in Colorado, and if we accept the modern investigations that phlyctenular keratitis is a manifestation of tuberculosis somewhere in the body, and that the local infection is either directly or indirectly a tuberculous process, we would naturally expect to see more phlyctenular keratitis. But we see very little, and almost invariably in the ill-fed, ill-nourished children who have not been properly taken care of from the cradle up. We do not see phlyctenular keratitis in the children of well-to-do families unless in exceptionally rare instances. I have had more or less experience in the use of tuberculin and desire to line myself up with those who are using it; I believe it is a means of arriving at a more definite, positive end than by the usual methods. I have been involved in a maze of conflicting emotions after reading the classical paper of Dr. Walters, and I am somewhat afraid that it would take about as long for me to understand his meaning as it would for the light of a star of lesser magnitude to reach the earth. In consequence, I hasten to agree with Dr Walter for fear of exposing my ignorance. I trust, however, that his sense of humor will enable him to appreciate my position, and that he will continue to knock at the doors of our understanding until we let him in.

Dr. J. S. Wyler, Cincinnati: I want to agree with Dr. Schoenberg and Dr. Black in some of the statements made. I do not feel that phlyctenular conjunctivitis or keratitis is purely a tuberculous condition. We have been able to sensitize animals to tuberculosis, but the sensitization has failed to produce phlyctenular conditions in those animals. However, when we have sensitized them, then, with the assistance of the *Staphylococcus aureus* we can produce typical phlyctenules in rabbits and guinea-pigs. This goes to show that the condition is a mixed infection on a tuberculous basis. I have had quite a number of cases of well-nourished young children in good circumstances who developed phlyctenular conjunctivitis and keratitis, and who, in later years, have shown not only no pulmonary or general tuberculosis but not even a recurrence, so that I believe the essential point is a staphylococcic infection on a possible basis of tuberculous origin that causes this condition. Hence I feel justified in condemning the use of tuberculin in this disease, feeling sure that less radical measures produce as good results.

Dr. J. A. Donovan, Butte, Mont.: Until I found out otherwise, I agreed to some extent with Dr. Ledbetter that many or all of these patients would get well. In one case, a man had relapses five different times. I put him on tuberculin treatment after I had exhausted the materia medica and he recovered. Following that case, a patient was sent in to have the eye enucleated. Having obtained such good results in the former case with tuberculin, I used it, and much to my surprise she regained vision to the extent of 50 per cent. and now has a good eye. I have treated six cases to completion, and have quite a number of cases under treatment by physicians in different places. These are the cases that I have had trouble with. It is pretty hard to explain to some one else what you want done and what you mean by reaction and dosage. We talk about small doses and large doses, and I do not know what you mean by small doses, and you do not know what I mean. I have started with the fifth dilution of an imported tuberculin (Koch) which makes about 1 drop of tuberculin in a gallon and a half of water, injecting 3 minims. If I do not get a reaction, I inject 5 minims. If I obtain a reaction, when it begins to subside, after from three to five days, I give a second dose. If I have quite a reaction, I repeat the same dose or give a smaller one. If I get little reaction, I add 2 minims to the dose. Formerly, I waited until the patient was normal before giving the second dose, but I read somewhere that better results were obtained by following it up more quickly. In my early experience I got considerable reaction; two were alarming. I changed from one preparation to another, giving the same dose, not knowing that the two preparations were not standardized the same, and I had a fearful reaction. Fortunately the patient recovered.

Dr. Hiram Woods, Baltimore: I want to follow up a remark made by Dr. Donovan, that the patient became suddenly blind from too great reaction. I have had a dread of local reaction in chorioiditis because there is not much room for such things if the exudate is near the fovea. Last winter I saw a woman, aged 37, married, and the mother of healthy children. One eye showed central chorioidal atrophy with practically no vision. The other eye had 20/15 central vision, good fields and accommodation, but there were peripheral chorioidal scars. The disk of this eye was red, not edematous, but the sort of disk which makes one suspect chorioidal hyperemia. An internist thought the urine indicated intestinal intoxication, but that a Wassermann, and, if this proved negative, a tuberculin test were indicated. The former was negative. Temperature was taken for two or three days and then 1 mg. of old tuberculin was used. There was no systemic reaction at all, but after three or four days the good eye showed cloudy vitreous, a perifoveal chorioidal exudate developed and vision fell to 10/200. Up to a month ago it had not improved. A day before the new chorioidal trouble was noted, the pathologist made a luetin test with a preparation received that day from the Rockefeller Institute. There was violent local reaction with formation of a necrotic ulcer on the arm which healed only after several weeks. Two interesting points are presented. The first is positive luetin reaction with negative Wassermann and no history even suggesting syphilis. Why was one negative and the other positive, and did the positive reaction mean syphilis? The second point, which is of great importance at the moment, is: Was the woman tuberculous without other than ocular symptoms, and has her eye suffered from a diagnostic zeal well meant, but possibly excessive? We accepted the indications from the luetin test and have treated her with mercury. Yet I am not so sure as I would like to be that we did not stir up a trouble in the good eye which might have stayed latent for an indefinite period.

Dr. William Zentmayer, Philadelphia: Dr. Walter speaks of the treatment pursued by Dr. Norris, my predecessor at Wills Hospital. He does not state what it was. The internal treatment was fractional doses of calomel three times a day and certain directions in regard to regime. The child was to have milk, eggs and fresh meat, plenty of fresh air and no sweet things and no fried food. He admits its efficacy and gives the explanation for it.

Dr. W. H. Wilder, Chicago: There is one phase of the treatment of these phlyctenular cases that cannot be too strongly emphasized, and that is the importance of fresh air. This was particularly impressed on me last year when visiting the late Professor Eversbush of Munich, who was much interested in the subject of the treatment of scrofulous or tuberculous eye diseases in children, which in cities, among clinic cases, are often so obstinate. Eversbush established a sanatorium at Tolz in the Bavarian Alps, an ideal situation for the treatment of such cases, and when I visited it with him, he had about thirty-five children there who were suffering from obstinate corneal or uveal lesions of a tuberculous type. They were being greatly benefited by the fresh air, in conjunction with the regular local treatment, administered by the nurses and physician in attendance. He had observed excellent results from the treatment of such cases in his sanatorium, and noted that they recovered much more rapidly and with fewer complications than similar cases treated in the city. It would be well if we could get the cooperation of certain sanatoriums and give our clinic cases the benefit of fresh air, combined with measures to improve the general nutrition. Unless we get a local reaction in the eye, we are not warranted in concluding that the ocular lesion is tuberculous, even if a general reaction follows the subcutaneous administration of tuberculin as a diagnostic agent. It is true that the general reaction may furnish a strong presumptive indication, but that is about all we are entitled to say, if the local reaction in the eye is lacking.

Dr. Oscar Wilkinson, Washington, D. C.: I desire to add to Dr. Wilder's remarks that proper food is almost as necessary as fresh air. These diseases occur among a class of patients who are poorly fed. One speaker said he had seen these cases among country folk with plenty of good food. It is well known that country people are not so well fed as city people. They have less variety, and the food is not so well prepared as that of city people. In the second place, we should not forget the importance of intestinal antiseptics. Dr. Bruns taught us that bichlorid of mercury internally was almost a specific. I know that with fresh air, good food, abstinence from sugar and sweets, and with internal antiseptics a chronic case of phlyctenular ophthalmia is an exception.

Dr. Ledbetter: By the time I get through with the diagnosis the patient is well.

Dr. Davis: Tuberculin does not act as a remedy, it stimulates the body. If you do not get a reaction stop using it. Watch the temperature and watch the patient. You are dealing with a powerful toxin. It is only an adjunct in the treatment.

Dr. Will Walter, Chicago: The reason for the 10 per cent. failure of positive von Pirquet in these cases, if they are of tuberculous origin—and some take this failure as evidence against such origin—may be explained. These reactions are specific, not only in that homologous antigens must be used, but even identical strains of organisms. In the hemolytic Wassermann reaction several strains of liver extract are now commonly employed and not infrequently we get reports of positive reaction for only two or three of these antigens. Irons has failed to get response in his cutaneous test for gonococcal infection until the same strain was found. He is now using a mixture of several strains. The difficulties in this regard are greater with tuberculin because of changes due to the prolonged time needed for the growth of bacilli in vitro. When fatal doses of tuberculin are given to tuberculous guinea-pigs one finds extensive hemorrhages in the foci. I have shown foci in gland and spleen from two guinea-pigs infected three months previous to our test. We gave one a small, and the other a large, diagnostic dose in ratio to body-weight. In the former specimen one sees intense hyperemia and in the latter hemorrhages are apparent. Such reaction of foci in the eye from the subcutaneous test might thus prove perilous to the integrity of vision or even to the eye itself since there is no way of judging, in advance, what degree of reaction may supervene.

TOPICAL DIAGNOSTIC VALUE OF THE HEMIOPIC PUPILLARY REACTION AND THE WILBRAND HEMIANOPTIC PRISM PHENOMENON

WITH A NEW METHOD OF PERFORMING THE LATTER *

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METHOD OF PERFORMING THE HEMIOPIC PUPILLARY REACTION

The usual method of examination of the hemiopic pupillary reaction up to the time of the appearance of the work of Hess was to throw a narrow pencil of light onto the blind and likewise onto the seeing retina, noting which gave the best reaction. Commonly an ophthalmoscope or other small mirror was used to reflect rays into the patient's eye from a light placed back of the patient's head. Ahlström[1] and others used an electric light encapsulated except for a 0.25 mm. diameter opening which gave a narrow cone of light to be thrown into the eye. Friedlander and Kempner[20] used a lens system to focus the rays at 4 cm. distance from the opening. Similar instruments have appeared in this country.

Wolf[79] used his electric ophthalmoscope to flash with corrective lenses a sharp image of a section of filament onto a definite part of the retina, at the same time observing the pupillary reaction. Heddaeus made an ingenious but apparently not very popular departure in using two lights of equal intensity exposed alternately without interval at equal distances from the fixation-point and from the eye.

Following the use of these methods, reports more or less favorable to the diagnostic value of a hemiopic pupillary reaction were received, among others from Wilbrand, Wernicke, Schmidt-Rimpler, Seguin, Leydens, Rothman, Henschen, Schwartz, Dercum and Oliver, Salomonsohn, Vossius and Lange; while more or less unfavorable reports are noted from Heddaeus, Brixa, Silex, Liebrecht, Hirschberg, Martins, Bach and Oppenheim, the last three rather giving the reaction the benefit of the doubt than denying its value.

Hess introduced the methods described of hemikinetic illumination of the retina and of concentric illumination about the macula, both of which render the dispersion light reaching the macula as nearly constant as possible.

Sachs,[61] unaware of Hesse's work, at the same time was using a modification of the same principle. The patient observed the center of a large bright reflecting white mat-surface. One half, then the other half, was quickly covered by a black curtain while the pupillary reaction was noted. Since the appearance of these works, reports more or less favorable to the diagnostic value of the hemiopic pupillary reaction have come from Best, Ginsberg and Dessauer, Behr, Krusius and Jess, while those more or less unfavorable have issued from Hess, Hesse, Laqueur and Veraguth.

Since so much depends on the method and apparatus used in examinations of pupillary reactions, it would seem advisable to give in some detail the instruments and method used in examination of the cases which follow. I have been forced to make up apparatus from material readily available about an ordinary laboratory. Certain points may then possibly be of interest to others similarly situated, since the apparatus is not on the market in this country.

After some search and experimenting it was found that certain tin containers to be obtained at any drug-store could be satisfactorily pressed into service.

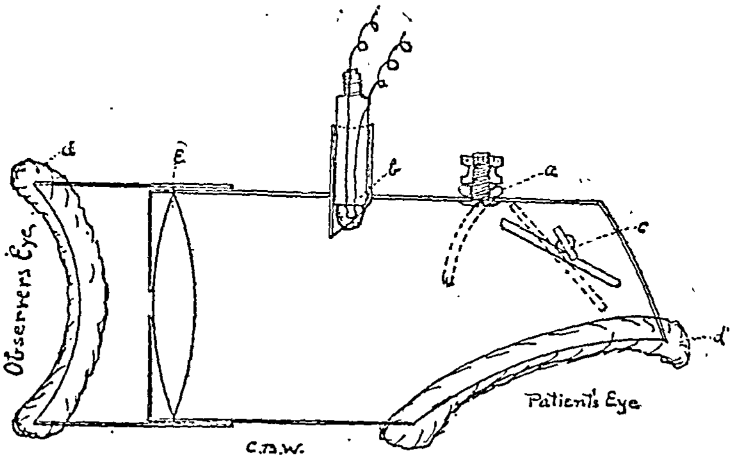

Fig. 1.—Objective Pupillometer: *a*, head-spring; *b*, ophthalmoscope lamp; *c*, mirror; *d*, *d'*, velvet pad; *e*, 14 D. trial-case lens.

Figure 1 represents a considerably modified monocular pupillometer after the principle of Krusius.[50] It is held in position over the patient's eye by a brass head-spring attached at *a*. A rheostated electric ophthalmoscope lamp (*b*) with frosted globe illuminates the patient's pupil whose image is thrown by the calibrated adjustable laryngoscopic mirror (*c*) into the observer's eye after being magnified by a 14-D trial case lens (*e*). All extraneous light is excluded from both eyes by the thick close-fitting black velvet rim-pads (*d*). By this means an objective examination of either eye can readily be made without interfering with the field of vision of the other eye.

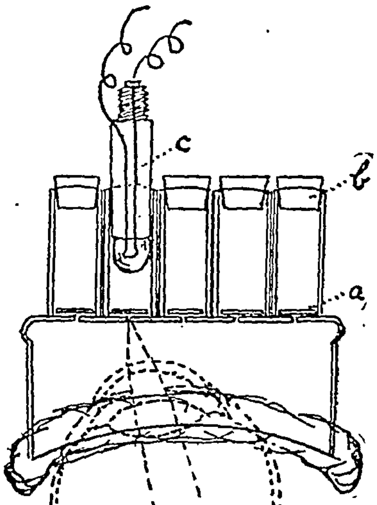

Fig. 2.—Entopic pupillometer: *a*, milk-glass; *b*, stopper; *c*, ophthalmoscope lamp; *d*, dispersion-circle.

In Figure 2 is shown the more accurate entopic apparatus modified from that used by Hess. A considerable improvement for clinical purposes I have found in the addition of several pin-hole openings which can be used at will on either eye to bring the dispersion-circle into the best position for observation, especially when field defects are present. In each case the pin-hole is illuminated through a thin milk-glass or oiled paper (*a*). The resulting dispersion-circle (*d*) falling on the retina is limited in size only by the size of the pupil. The apparatus is fixed over the eye, and outside light excluded in the same manner as that described before. With these modifications many more patients are able to use this method. Only average intelligence is necessary.

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* The major part of this work was performed while acting as assistant on Dr. Harvey Cushing's staff at Johns Hopkins Hospital, Baltimore, during 1911 and 191[illegible]. The remainder was done in Boston on Dr. Cushing's neurological surgical service at the Brigham Hospital, Harvard Medical School, and at the Massachusetts Charitable Eye and Ear Infirmary.

* Because of lack of space, this article is abbreviated in The Journal. The complete article appears in the Transactions of the Section [illegible] the author's reprints.

Figure 3 shows the form of test-light (*A*) used. The strength of the light may be varied in the first place by choice from a series of lamps ranging from 2.8 volts to 5.5 volts, tungsten filaments, secondly by resistance (*R*, *R'*) connected in series, and thirdly by regulating the ordinary rheostat current by which the electric ophthalmoscope is operated from the house-current and finally by different sizes of diaphragms (*b*) thereby varying the area of illuminated milk-glass (*a*) from any size up to 4 cm. in diameter. This light-capsule is attached to a carrier (*c*) traveling on an ordinary plain perimeter with arms bent back to form a wider arc (from 20 to 30 cm. radius).

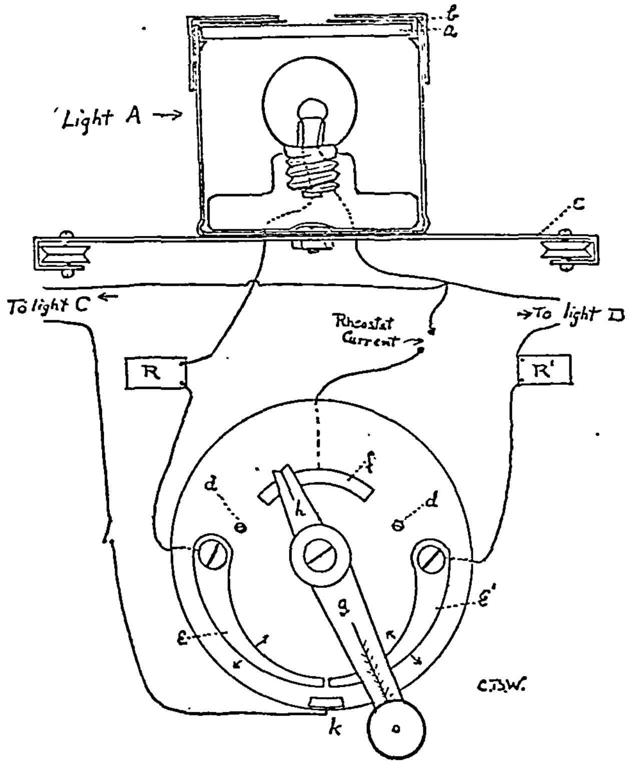

Fig. 3.—Test-light scheme: *a*, milk-glass; *b*, diaphragm; *c*, carriage; *R*, *R'*, resistance; *e*, *e'*, movable contact-bar; *d*, *d'*, stops; *f* and *h*, circuit-breaker; *g*, alternating-switch; *k*, contact-bar for light *C*.

For isokinetic, hemikinetic and other tests I have devised a simple switch and wiring system for controlling two exactly similar lights as desired. The switch has two contact bars (*e*, *e'*) movable as indicated by the arrows so that any interval or no interval, with one contact being made before the other is broken, can be obtained by adjustment. In the position shown in Figure 3 the current will light B. Moving the switch across the interval lights A and turns off B. Either light may be turned off without lighting the other by throwing the switch further over till *h* leaves *f* and strikes either top (*d*, *d'*) as the case may be. By means of the resistances (*R*, *R'*) two equal lights can be balanced quickly in an ordinary photometric box, and by adjustment of the switch can be made to show no change of intensity in alternate lighting both in the photometric box and by a further slight adjustment, on the normal pupil by the entopic method. Of course much stronger lights can be used with the same system.

While this method, when the larger diaphragms are used, is satisfactory in performing the hemikinetic test of Hess, it is also desirable to have at hand the instrument of shutter-type as described. I have applied a different style of shutter which has several advantages. The shutter shown in Figure 4 is rotary and not sliding as devised by Hess. This shutter gives a symmetric distribution about the macula, with the weak or peripheral retina receiving the largest part of the image, while the smallest part is nearest the sensitive macula. The shutter works smoothly and accurately and without shaking the instrument as the sliding shutter of Hess may do. Most important of all, the light in changing is cut off and added in increments situated with absolute symmetry with respect to the macula, while with the sliding shutter during the change light is taken from one side and added to the other side at a different distance from the macula. This will cause a slight reaction at the time of alternation, aside from light adaptation phenomena. A plain shutter of the rotary type having fixed sizes of light surface is easy to make; but considerable and accurately symmetric variation in the size of the light-surfaces without changing the fixation-point may be obtained by use of segments patterned as shown in Figure 4. These segments cross in the center, scissor fashion, and make up a disk. Superimposition of segments not crossing the center gives a flat surface on which the semicircular shutter may rotate. A fine hole through the central binding-pin serves as a fixation-point. The shutter is operated by a spring lever as in the ordinary rotary camera-shutter.

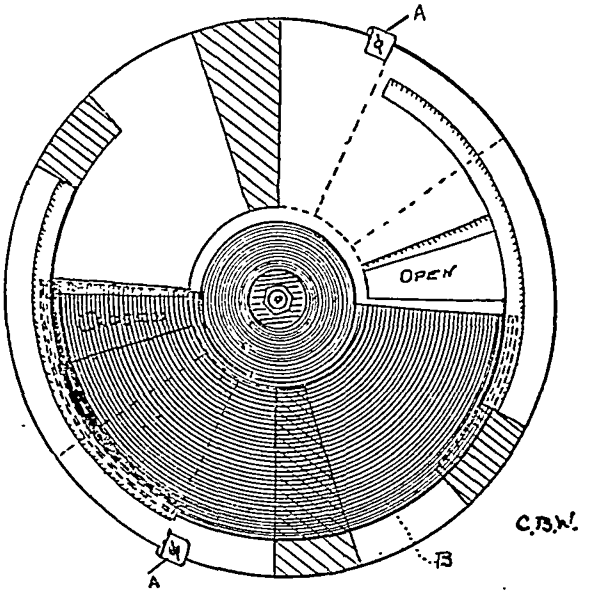

Fig. 4.—Rotary Shutter Disk: *A*, *A'*, fixing clamps for holding segments in place.

METHODS OF PERFORMING THE WILBRAND HEMIANOPTIC PRISM TEST

As originally suggested by Wilbrand, neither the strength of the prism nor the distance of the patient from the point of fixation was definitely stipulated. Different observers have varied both the distance and the strength of the prism. Some have used a light as a fixation-point instead of the white spot on a black wall as originally suggested. Heine further suggested a combination of the Wernicke and Wilbrand tests, using as a fixation-point a source of light which was strong enough. To this method it seems to me that there are serious objections which will be considered later.

While I have used the usual prism method, I have used in addition a device which is free from certain difficulties attending the use of prisms. At first a single electric light such as the test light shown in Figure 1 was used. The light-surface was covered with thin black silk gauze or a very thin coat of a diluted black paint so that it was invisible when not lighted on a black background or behind a black screen in a dark or semidark room. It was then regulated to an intensity such that no sense of dispersion-light sheen was notable in the normal eye when the image of the light fell on the blind spot. This light was used as a fixation-point at a distance of 1 or 1.5 mm. usually. Now with a small noiseless switch one may turn off the light in the same instant or the instant before the prism is interposed to throw the image onto the blind retina. In this way one may compare the action of the eye when its blind retina is actually stimulated and when it is not, under the same conditions.

This method was further improved by use of two lights a certain distance apart and the switch shown in Figure 3. In this case a prism may or may not be used, and the distance between the lights may be made to correspond with strong or weak prism values. Finally, by the addition of segments to the switch, three or more lights were used in the same way. Thus the extra segment (*k*) is used to operate the third light (*C*) when the other segments (*e*, *é*) are swung down opposite it. This extra segment is a slightly lower plane than the other segments, and the light (*C*) may be turned out without lighting the others by simply raising the switch handle. By means of an arrangement of this sort one can perfectly control the appearance and disappearance of the fixation-point in any part of the field. Further, in addition to varying equally or unequally the horizontal distance of the secondary fixation-points from the central fixation-point, one can also vary in the same way the distance of the former, above or below the latter in different parts of the field, by attaching the lights to arms movable about the center. This is very important in analyzing the psychologic complex which I believe to be present in this phenomenon.

A detailed report of twelve hemianoptic cases—both anterior and posterior lesions—together with the complete bibliography and history of the subject may be found in the original presentation, but a summary of the examination results in these cases may be given here.

SUMMARY: I. THE HEMIOPIC PUPILLARY REACTION

From a study of the physiologic and physical difficulties in making hemiopic pupillary tests, certain errors become obvious which have doubtless been common to a large number of reports. These have of course been chiefly in the use of single beams of light.

Thus Seguin in his bitemporal cases carried the light slowly from the temporal side to the center. The pupillary reaction was then so gradual as not to be noted until within from 50 to 60 degrees of the center. Now on the nasal or seeing side the light was thrown abruptly over the bridge of the nose, and the reaction noted at once, since it could not be started at 90 but at 60. The obstruction offered by the nose is particularly effective in producing an error in the group of bitemporal hemianopsias in which a hemiopic reaction should theoretically occur. Also the use of the old electric instruments favored variation of the distance of the light-source from the pupil with corresponding pupillary change, there being a tendency again because of the nose to vary the distance on the nasal and temporal sides.

The combination Wernicke and Wilbrand test of Heine is open to several errors. If this light is 20 feet distant and strong enough to give a pupillary reaction it will also give a definite sheen of dispersion-light when thrown on the blind retina so that the patient has a cue which way to move the eye. If it is weaker it must be inside of 20 feet, and when the instant loss of fixation occurs the pupil dilates with disaccommodation and contracts again on refixing, owing to accommodation or convergence, as well as to the light itself. Psychic reactions must of course be carefully excluded.

For clinical purposes in testing for the hemiopic pupillary reaction a rotary hemikinetic shutter of the type described is, I think, the instrument of choice, since the openings are more symmetrically arranged and exposed than the sliding types of Hess, are easily regulated and are absolutely alike as to size, though somewhat more difficult to construct properly. Balanced electric lights with a switch as described are more difficult to keep in adjustment, but their use requires no assistant. The presence of a slight reaction or pupillary jump at the instant of alteration in these methods have been considered light-adaptation phenomena. If present at all, the pupillomotor activity of the peripheral retina is so extremely weak that this explanation would not seem to hold. Indeed, when this phenomenon occurs it is usually caused by faulty mechanism or possibly a psychic or psycho-accommodative effect.

It is notable that failure to elicit hemikinesis has occurred in hypophyseal cases which reached the stage of complete hemianopsia to normal disks only a comparatively short time before examination. That optic atrophy had not progressed far was shown by the rapid recovery after the physiologic or functional block had been removed by operation—in some cases over one-fourth of the temporal field being recovered at the first field examination four days after the operation. Possibly, then, the pupillomotor function in the macular region had not suffered sufficiently to give noticeable hemiopic pupillary reactions. When the macula is artificially blinded so as to reduce the central pupillomotor activity, not only is the fixation likewise greatly impaired, making the examination very difficult if not impossible, but also the patient is apt to blame any subsequent loss of central vision to this procedure.

In case the macular region is damaged we have presumptive evidence, when taken in consideration with the form of the field defect, of an anterior lesion since central scotomas are far more common in these lesions than in posterior lesions. The presence of a central scotoma should in addition to its diagnostic value make the examination of hemiopic pupillary reactions easier, owing to the decreased activity of the pupillomotor macular fibers; but on the other hand the difficulty of fixation makes the examination more difficult. If the central scotoma is in one eye only, fixation may be maintained by use of the other eye with an instrument I have devised,* but it necessitates the observation of the direct pupillary reaction. If the results are not consistent they are of course valueless. Indeed, the consistency of the results in Case 1 is the only reason for attaching any importance to them. The possibility in this case that the pupillomotor fibers in the macular region may have suffered in a more or less one-sided manner is interesting, but of course not conclusive from the case cited. It is evident, however, that even if the hemiopic pupillary reaction proves demonstrable in this group of cases its usefulness will be very limited indeed.

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* Walker, Clifford B.: Some New Perimetry Instruments. The Jour. A. M. A., July 26, 1913, p. 277.

Concerning the bearing of the presence of pupillary reaction in central scotoma cases on the theory of Heddaeus and of Hess that only the macular region is pupillomotoric, the findings in Case 7 seem to be particularly illuminating. It is at once suggestive of that group of cases reported as having central scotomas but still retaining pupillomotor activity, although the area of central retina involved was greater than that determined by Hess as the pupillomotor area. In such cases it is easy by the use of two or more disks to determine the size of the scotoma; but to locate the position of the macula in the scotoma is not so easy, and in the case of double central scotoma may be practically impossible. It must be remembered then that the macula may be eccentrically situated in the scotoma so that the entire pupillomotor retina is not damaged. Further, it seems to me that it must be demonstrated that light-perception is nil in the scotoma area although disks cannot be seen to move. To determine the light-perception in a scotoma with a single light is practically impossible since the patient can always detect the light by the sheen of dispersion-light, exactly such as one sees in the dark room when a beam of light is thrown on the blind spot in the normal eye. In determining these points I applied a new method described in the examination in Case 7, using my alternating pupillary lights to get the size of the scotoma for light and then comparing it with the blind spot. It then became apparent that in all probability the area of absolute central scotoma could not involve the entire area of pupillomotoric retina as measured by Hess. Indeed, as a rule it would seem safe to assume that the best test as to whether a central scotoma of this particular size is absolute or not would be the absence of pupillary light reflex, provided there was no other reason to account for the absence other than the scotoma.

II. THE WILBRAND PRISM TEST

I believe that in the Wilbrand prism test the factors of intelligence and habit have not been sufficiently controlled in previous observations. Posterior lesions commonly give homonymous field defects. In the horizontal plane it takes only one coordinate movement of the eyes to bring into view objects on the blind side. That is easily remembered and soon learned by the intelligent patient. It becomes a habit to look on that side for something that has disappeared. Refixation becomes accordingly more rapid than in bitemporal cases which are commonly anterior lesions. In the latter the patient gets little or no training in refixation ordinarily, since the defective temporal field of one eye is aided by the nasal field of the other eye. When one eye is lost or when central scotoma develops in one eye, as is common in anterior lesions, the habit of refixing in the other eye would naturally develop according to the intelligence of the patient.

It would hardly seem fair to compare the refixation ability in these two groups of cases unless the patients have had equal experience and habit-formation. This condition will be fulfilled only by those patients in the bitemporal group who have lost one eye, or the condition might be brought about by blinding one eye artificially until the patient became well accustomed to such a state of affairs. The same would be true of anterior lesions producing hemianopsia in only one eye, but of course would not hold for that rare group of anterior lesions producing homonymous hemianopsia. The latter would be directly compared with the group of posterior lesions.

When these factors are considered and the examination conducted after the method I have described with multiple alternating lights or even with a disappearing object and a prism, several interesting points are noted. In general the refixation-time in all cases increases as the displacement of the object onto the blind side increases, and for each displacement decreases more or less on repetition, provided the patient is intelligent and the displacement is made in the same way each time. If, however, the displacement is varied to different distances above and below the horizontal plane through the fixation object, more or less confusion may be introduced in all cases and a marked tendency may be noted in all cases for the patient to move his eye to the point where the object was last seen rather than directly at the point above or below, as the case may be, where the object may really be refixed. Indeed, this tendency to look toward the previous point of displacement on the blind side is marked even when there is no stimulus whatever, the object in the center having simply been made to disappear. This paradoxical effect of an apparent stimulus arising in the real absence of a stimulus serves well to show the factors of intelligence, observation and habit which may complicate these tests.

While it may be noted that the refixation time is in general greater in the bitemporal hemianopsias of anterior lesions than it is in homonymous posterior lesions, it is also true that patients with the former, if intelligent, reduce their reaction-time more markedly as the number of trials increases. To keep one eye of such a patient bandaged for a length of time and note the effect on the refixation-time in the other eye would be interesting, although I have not yet been able to carry it out, except for comparatively short periods of time.

That the Wilbrand prism phenomenon is a pure reflex receives little or no support in the observation of these cases, while there are several points, as mentioned, indicating that the phenomenon is the functional result of more or less intelligent observation and consequent habit-formation. The form of the field defect has a bearing on these factors as well as on the site of the lesion; indeed, it apparently often accounts entirely for the results of the test, when conducted after the described method. Thus the Wilbrand test would seem to be more of a measure of a certain power of observation than a test for the integrity of a definite reflex arc.

CONCLUSIONS: I. HEMIOPIC CAPILLARY REACTION

1. Nothing has been noted in these cases in disagreement with the theories of Heddaeus and Hess that the peripheral retina lacks pupillomotor sensitiveness.

2. The possibility of a hemiopic pupillary reaction within the pupillomotoric area is suggested.

3. In absolute central scotoma cases the absence of direct pupillary reaction without other cause than the scotoma speaks for the absolute central involvement of an area at least as large as the pupillomotor area, while

the presence of direct pupillary reaction when the central scotoma is greater than the pupillomotor area as tested by large disks requires further tests for light-perception as described.

4. Observations may be complicated by "concentric movement" or other psychic reactions which may sometimes be eliminated by repetition.

5. Clinically the hemiopic pupillary reaction, in those chiasmal lesions of dyspituitary origin, of rather rapid onset and rapid recovery after operation, has failed, possibly due to a certain retention of pupillomotoric function, centrally, after vision for disks has been lost by the hemiopic retina.

II. THE WILBRAND HEMIANOPTIC PRISM PHENOMENON

1. The peculiar distribution of field defects in anterior and posterior lesions often adds to and encourages psychologic factors which greatly complicate the Wilbrand test.

2. The presence of pseudorefixation, as demonstrated by the new method described, throws serious doubts on the presence of a definite reflex arc in the Wilbrand prism-phenomenon.

3. Clinically, the Wilbrand test has offered no valuable diagnostic data in these cases.

All the cases mentioned in the paper were examined in the large neurologic surgical clinic of Dr. Harvey Cushing, to whose kindness and generosity I am deeply indebted for the privilege of presenting this particular phase of these cases. I extend my sincere thanks to Dr. Cushing for stimulating interest in this work, to Dr. George S. Derby, without whose suggestions and encouragement this report would not have been made here, and to Dr. F. H. Verhoeff for friendly discussion and criticism.

ABSTRACT OF DISCUSSION

Dr. C. D. Wescott, Chicago: Dr. Walker deserves praise for his careful investigation and for the construction of this ingenious apparatus. A careful study of his paper and his conclusions, however, leads me to think that the tests, as developed at present, are not sufficiently accurate to be generally adopted. It seems to me the patient must be of exceptional intelligence to cooperate with sufficient accuracy to make them of practical value.

Dr. Clifford B. Walker, Boston: The fields were taken with this new set of instruments, of which a short description may soon be found in The Journal.

PREVENTABLE BLINDNESS—A CHALLENGE TO THE PROFESSIONS *

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In a *country* keen for pleasure and success, the tragic thwarting of a hundred thousand citizens[1] by blindness in a paradox. It is more; it is a challenge. And when we consider that, among these hundred thousand blind, about 25 per cent. are disabled through the failures of three great and old professions—medicine, business and statecraft—and of one upstart profession—social service—then this challenge assumes an ironical air. Do twenty-five thousand persons, by their blindness, deprive the country yearly of perhaps seven or eight million dollars' worth of productive labor, not because of any lack of knowledge and power on our part, but because of our failures in applying the knowledge and power which we possess?

The problem of preventable blindness is in theory simple. It is a problem in the elimination, through the canniest possible organization, of waste: the waste involved in fruitless lawmaking, bungled administration, medical education often unworthy of the name, medical service, here sparse, there prodigal without avail, a myopic industrial system, and social service, hovering on the outskirts, eagerly interested in immediate needs, but dull to the essential need.

As the elimination of such waste in clinics is a point to which I shall more than once recur, let me cite some actual accomplishments. For example, at the Boston Dispensary Eye Clinic, in 1910, one-half of the physician's refraction work was found to be wasted. As Hartshorn and Davis have explained,[3] a trained worker in medical-social service was assigned to this clinic with the following results: In the autumn quarters of 1910 and 1911, the spring quarter and two autumn months of 1912, an average of about 350 patients, per quarter, were found to need glasses. Before the advent of the social worker about half of these patients would have failed to have their prescriptions filled. In the first of these periods, however, only 29.4 per cent. did fail to obtain glasses; and in the succeeding periods this percentage dropped to 20.4, 7.9 and finally 4.5 per cent.

Before the advent of the medical-social worker in 1910, 44 per cent. of the patients with iritis, phlyctenular disease, acute conjunctivitis and blepharitis paid only one visit. In 44 per cent. of these cases, therefore, the physician's work was likely to be lost. Two years later the percentage of lost cases, in the same clinic and with the same medical service, was reduced from 44 to 24.5. In other words, the physician saved about 20 per cent. of wasted effort. As for the effect on the patients, the percentage of those whom the physician considered cured rose from 17, when he worked alone, to 40.5 when he was backed up by a medical-social worker.

In view of these results, is it not safe to say that efficient management in clinics can be made a potent factor for minimizing blindness?

CAUSES OF BLINDNESS AND METHODS FOR PREVENTION

A study[4] made at the request of the Massachusetts Commission for the Blind, in 1910, shows that among 301 cases of practical blindness in three Boston hospitals (1908 and 1909) the causes were as follows:

Diseases.	Cases Per Cent.
Glaucoma	15.3
Injuries	12.0
Uveitis	13.6
Optic atrophy	11.6
Diseases of the cornea (*excluding gonorrheal conjunctivitis, interstitial keratitis and trachoma*)[5]	10.0
Ophthalmia neonatorum	4.3
Syphilis[6]	6.0
Trachoma	2.3

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* Because of lack of space, this article is abbreviated in The Journal. The complete article appears in the Transactions of the Section and in the author's reprints.

[1] About 118,000. This estimate is based on the proportion of blind to the total Massachusetts population found by the Massachusetts Commission for the Blind, whose register indicates 4,275, or 1.27 per thousand population, as against 2,278 recorded by the 1910 census. In other words, it seems to show that the census recorded only 53 per cent. of the actual cases. The fourth annual report of the Delaware Commission for the Blind (p. 16) shows 286 blind as against 138 shown by the 1910 census. In other words, it indicates that the census recorded only 48 per cent. of the actual blind in Delaware.

[3] Hartshorn and Davis: Follow-up Work as an Element of Efficient Treatment in a Clinic for Eye Diseases, Boston Med. and Surg. Jour., April 10, 1913.

[4] By the Research Department, Boston School for Social Workers, supported by the Russell Sage Foundation.

[5] This includes seventeen cases of leukoma, some of them probably due to ophthalmia neonatorum and others to injuries.

[6] This percentage is based on the cases diagnosed as syphilitic and is possibly much lower than the facts would warrant.

Assuming, now, as we safely may, that these diseases, in varying proportions,[8] are the main causes of blindness throughout the country, let us consider how best to attack them. Against few, if any, shall we find the purely medical attack quite adequate, while against others we shall find the support of the city, the state and even the nation, a necessity.

Optic Atrophy.—The attack on optic atrophy seems to call for relatively little non-medical support—not that the profession has so far succeeded in greatly reducing blindness from this cause. Optic atrophy, on the contrary, was a sort of medical *bête noire* until lately, when research began to make its etiology somewhat more clear.

For example, in a case which Dr. George S. Derby kindly permits me to quote, the patient would usually be given a careful, but merely local, examination, after which a diagnosis of optic atrophy would be made. As a matter of fact this patient, B. C., was first seen at a Boston hospital last October, since which time he has been under constant ophthalmologic supervision, numerous examinations having been made. The diagnosis was secondary optic atrophy, cause unknown. After several months of examination in medical, surgical, neurologic, laryngologic and ophthalmologic clinics, during which time four roentgenograms were taken, two Wassermann tests were performed and a lumbar puncture was done, a diagnosis of probable tower skull was made by Dr. Harvey Cushing and a decompression performed in the hope of arresting the atrophy.

This case is, of course, unusual. But does not hope of reducing the present percentage of blindness from optic atrophy of different origin depend very largely on just such intensification of diagnostic method? If so, and if accurate diagnoses must often be based on study by varied experts, we are faced by an economic as well as a medical problem. For though B. C., a very poor man, received this expert attention almost gratis, many of us on small salaries, if attacked by optic atrophy, might have to surrender ourselves to hopeless blindness.

If, then, salvation from this disease is not to be restricted mainly to plutocrats and the proletariat, physicians, hospitals, social engineers and philanthropists must unite in providing, throughout the country, available facilities for examination and tests by specialists in the most diverse fields of medicine.

Glaucoma and Trachoma.—While glaucoma and trachoma, from the medical point of view, are obviously poles asunder, as causes of blindness they have one point in common; both seem to vary with race. The Massachusetts investigation appears to have shown that where English and Hebrew immigrants predominate, we may expect to find glaucoma unusually prevalent; while as for trachoma, immigrants from southeastern Europe and from Asia are so disproportionately infected that, other things being equal, this disease will be most prevalent where such immigrants abound. The control of both these diseases must therefore depend partly on control of immigration. In the case of glaucoma, a noninfectious disease, the federal government can be expected to exclude only blind persons or persons threatened with blindness. In the case of trachoma, however, immigrants known to be infected are deported, and, better still, are turned back at the port of embarkation.

Glaucoma, a probably hereditary disease, may some day be limited by eugenic education. Meantime, blindness from glaucoma will result most often in cases for which expert medical care is far to seek. The elimination of blindness from this disease must, therefore, largely depend both on the colonization, so to speak, of ophthalmologists in cities and towns where they are needed, and on a wise distribution of public clinics; and these must be not only accessible, but also almost inescapable. In clinics, new glaucoma patients may, for example, be "calendared" at the social worker's desk, so that they will be automatically followed up if they fail to return for treatment on the day which has been set by the physician. By the employment of this simple method delays of which the results would be tragic can easily be prevented.

Injuries.—The prevention of injuries, which account for some 14 per cent. of our cases of blindness, has already been shown to depend in part on such complex industrial factors as workmen's compensation and factory inspection laws, public education, active safety work by employers and employees and facilities for first aid and expert medical treatment. Outside of the realm of industry, the prevention of holiday injuries and injuries at home, in play, etc., something may be done both by law and by educational work in schools and through clubs and associations. Against disablement by both the industrial and the non-industrial type of injury, vocational guidance may also be made a potent weapon; for the Massachusetts study shows that these injuries, superposed on cases of disease, do from two to three times as much damage, in terms of binocular disablement, as is done by injuries occurring singly. In other words, men who are practically one-eyed already, form more than half of those whom injuries reduce to practical blindness. For this reason, if for no other, it is highly important, first, to prevent monocular blindness, whether from accident or disease, and, second to keep one-eyed men and boys, whenever possible, out of occupations dangerous to eyesight.

Gonorrheal Conjunctivitis and Ophthalmia Neonatorum.—A perceptible cause of monocular blindness in adults, gonorrheal conjunctivitis, with the less common pneumococcus and other infections, is far more serious among infants. The usual estimate of 10 per cent. of all cases of blindness is perhaps not far from the facts in most parts of the country. It was shown last year, however, that blindness from ophthalmia neonatorum can be reduced as low as 2 per cent. of all the new cases of blindness occurring in a state of three million inhabitants.[9] Instruction and supervision of obstetricians, public-health education, the required reporting of symptoms by physicians as well as midwives and public supervision of the treatment of reported cases—these and other well-known measures should gradually make ophthalmia neonatorum as rare as smallpox, as a cause of binocular blindness, and very unusual even as a cause of monocular blindness.

Syphilis.—The Massachusetts study seems to have shown that syphilis, both acquired and congenital, is responsible for a higher percentage of practically blind patients than one might perhaps infer from the accepted figures for total blindness. Now if syphilis is responsible for 6 per cent., or even half that proportion, of the practically blind in a typical large city, it is not enough to make a diagnosis, or even to inform the average patient that constitutional treatment is necessary. We must somehow make certain that the disease at the root of the local symptoms is actually and thoroughly treated.

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[8] Stricker, Louis: Blindness and Conservation of Vision: a Sociologic Study, the Civic News, Cincinnati, March, 1913.

[9] This statement is based not only on reports to the Massachusetts Commission for the Blind and data furnished by the State Board of Health, but also on 144 answers to a special letter of inquiry sent to hospitals and oculists and general physicians throughout the state.

Especially in cases of interstitial keratitis, as Derby and Walker[10] have recently pointed out, eye disablement, as well as other serious disabilities, can often be prevented only by the most persistent of social follow-up work. Without this work, such cases as the following are frequent: A little girl of 8 appeared at the Massachusetts Charitable Eye and Ear Infirmary with interstitial keratitis. The treatment was local. Then followed treatment in twenty-eight different clinics all over Boston—nose, throat, lung, children's and surgical—as various symptoms appeared. Treated singly and without reference to the underlying cause, the symptoms of congenital syphilis made this child a "clinic trotter" along a zigzag path leading anywhere but to health. But when taken in charge by ophthalmologist, syphilologist and social worker together, this child received persistent constitutional as well as local treatment. Her eyes, ears and general condition all markedly improved; and the child, as it now appears, was saved from partial if not total blindness.

Uveitis.—All cases diagnosed as syphilitic or tuberculous having been separately classified uveitis in our Massachusetts study, usually refer us back to cases of iritis, iridocyclitis, chorioiditis, etc., of uncertain etiology. If uveitis, as our results seem to show, causes about 14 per cent. of the cases of practical blindness, further measures of prevention are essential. Now few, if any, of the patients in question would have lost all useful vision if they had received early, intelligent and thorough treatment. Once more, therefore, our problem seems to be very largely social and financial—the problem of placing ophthalmologists where they are most needed and of making clinics more effectual by the elimination of medical waste.

Diseases of the Cornea.—Excluding gonorrheal conjunctivitis and ophthalmia neonatorum, interstitial keratitis and trachoma, we find that diseases of the cornea, mainly keratitis of uncertain etiology, and corneal ulcer, often of traumatic origin, are apparently chargeable with 10 per cent. of our cases of practical blindness. Results of this kind at the hospitals from which our data were gathered must mean that patients either neglect or waste the medical service provided. If similar results prevail in other parts of the country, it is again obvious that medical facilities must not only be made accessible when needed, but also so managed as to prevent these diseases from contributing largely to the total of practical blindness.

We have now glanced at the chief causes of preventable blindness. In so doing we have seen that the preservation of eyesight from each and all of these causes involves not only medical skill, but also education, law and its administration, social service work, and a wise distribution of medical facilities. If we went on to consider remediable causes of blindness, such as senile cataract or congenital cataract, or such secondary causes as measles and meningitis, we should find the same conclusions true. If brief, then, it is safe to say that, in the whole field of work for good eyesight, social organization, in the broadest sense of the term, must supplement and support even the best of medical efforts.

STEPS WHICH OUGHT TO BE TAKEN

What plans of work and what forms of organization should now be adopted?

There are organizations for the conservation of eyesight in Arkansas, California, Indiana, Kentucky, Maryland, Massachusetts, New York, New Jersey, Ohio, Pennsylvania and Wisconsin. Through answers to direct inquiry, we learn, however, that their work has so far been mainly confined to public education through pamphlets, lectures, etc., except in Kentucky, Massachusetts, New York, Ohio and Wisconsin. Perhaps the most distinctive achievements in these states have been:

1. In Kentucky: The "Mountain Fund," so called, and the traveling clinic by which Dr. Stucky and his assistants have carried into the mountains their campaign against trachoma and other eye diseases and defects

2. In Massachusetts: (*a*) Studies of causes of blindness and partial eye disablement; (*b*) the joint campaign by which the State Board of Health and the Commission for the Blind have secured a relatively strict enforcement of the ophthalmia neonatorum reporting law, the following up of all reported cases and legal or other action against persons involved in cases of partial or total blindness due to ophthalmia neonatorum and neglect; (*c*) the consequent reduction of ophthalmia neonatorum, as a cause of blindness, to 2 per cent. of all new cases; (*d*) extension work by the Commission for the Blind through its field agents in teaching patients, charitable agencies, etc., in the remoter districts, how to make the most of existing facilities for treatment; (*e*) the establishment of an evening pay eye clinic in Boston; (*f*) the gathering of information and the reduction of waste by the instalment of social service departments in eye clinics; (*g*) the opening of a special class for children with defective eyesight by the Boston School Board, and (*h*) the utilization of the workmen's compensation law as a practical measure for the conservation of eyesight.

3. In New York: (*a*) improved training of midwives; (*b*) special public schools for children with trachoma; (*c*) special teaching in the regular public schools for children with defective vision; (*d*) a recent investigation of wood-alcohol poisoning; (*e*) factory-illumination legislation and legislation for the prevention of accidents, and (*f*) not only a modified system of reporting for syphilis and gonorrhea, but also an appropriation of $55,000 in New York City for a hospital for the treatment of these diseases.

4. In Ohio: (*a*) the campaign of the State Commission for the Blind against ophthalmia neonatorum, including the employment of nurses to follow up cases, and the prosecution of delinquent midwives.

5. In Wisconsin: (*a*) the required use of a preventive at every birth, (*b*) the follow-up work for cases of ophthalmia neonatorum begun by the Department of Child Hygiene of the Milwaukee Board of Health, and (*c*) activity by the Industrial Commission promoting safety work among both employers and employees.

From this summary it certainly seems probable that these are the states so far contributing most to our campaign. And, if so, is not the question of organization very nearly settled by experience? For in these states, and in these states only, are there state-wide organizations with paid executives. The experience of these states seems indeed to amount almost to proof that work for the conservation of eyesight can best be carried on, not merely by committees, whether exclusively medical or partly lay, but also through the services of executive agents.

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[10] Derby, George S., and Walker, Clifford B.: Interstitial Keratitis of Luetic Origin, Tr. Am. Ophthal. Soc., 1913.

Such agents seem to work most ingeniously when stimulated by association with persons blind, becoming blind or recovering from blindness. They will therefore generally be associated with schools, or directed by organizations, for the blind. And as effectiveness requires coordination of the work of varied state and city departments, whether of health, labor, education or law, these agents can probably best work under state commissions for the blind, such as that created by the Ohio statute. The practical problems of conserving eyesight, however, are so complex and varied that their developments must be supervised by a committee of experts—ophthalmologists and other medical specialists, public health experts and experts in education, industrial safety work, etc. This type of organization is perhaps the most efficient to date.

Whatever the ideal may be, each state must freely work out its own form and its own methods of internal organization; but in doing so each state should have the opportunity of testing its plans and its achievements by matching them up with the plans and achievements of other states. For busy men and women such comparisons are at present difficult almost to the point of impossibility. To make such comparisons easier, some form of interstate organization is clearly needed.

CONCLUSIONS

The facts which I have cited seem to indicate this conclusion: The problem of unnecessary blindness, which has so largely baffled and sometimes even disgraced the professions of medicine, business, statecraft and social service, demands for its solution the following measures:

1. A campaign of medical and lay research and education, government action, medical treatment and social work carried on, wherever possible, to limit and to remedy ocular disease, especially the more prevalent and damaging diseases and defects.

2. In the work of public education, special stress to be laid on the importance not only of ophthalmia neonatorum and trachoma, as causes of blindness, but also of glaucoma, syphilis and ocular injuries.

3. Medical schools to emphasize the interrelation of ocular and general disease, to teach their students the importance of consultation with ophthalmologists and a high sense not only of human service but also of the physician's duty to uphold the health laws, both national and state.

Hospitals and clinics urged to provide ophthalmologists with every possible facility for the diagnosis and treatment of obscure cases, including the help of pathologists, syphilologists, brain specialists, Roentgen-ray specialists, and others.

4. The prevalence of blindness studied in each state in relation to its more prevalent causes, on a basis of reports of cases of blindness to state commissions or other central agencies.

5. To promote such intelligent study of the prevalence and results of eye diseases, a committee of the American Medical Association to request hospitals and ophthalmologists to include in all their eye records the following data: age; sex; single, married, widowed or divorced; birthplace; birthplace of parents; occupation or school grade; in possibly syphilitic cases, the number of children, still-born, dead or living, and in traumatic or possibly traumatic cases, the tool or machine used, and the manner of injury.

6. To facilitate the comparison of results the following standards of vision officially adopted: for blindness, the German standard, vision fingers 1 foot or less; practical blindness, vision less than 20/200 with glasses; partial disablement, vision 20/200 to 20/50, inclusive, with glasses.

7. Making it the duty of the state boards of health or of special private agents to study the needs of all localities; and in cooperation with medical schools and hospitals, to bring to the notice of young ophthalmologists opportunities for work in places especially requiring their services.

In remote districts, where peculiar conditions require it, such clinical expeditions as those of Dr. Stucky in the Kentucky mountains.

In large cities, self-supporting evening clinics, with paid ophthalmologists in attendance, organized to compete with charlatans and inefficient practitioners and to provide self-respecting patients on low wages with facilities for expert treatment otherwise hard to secure.

In clinics and hospitals, the specialist's work made more efficient by insisting on proper treatment of diseases underlying local eye symptoms and by keeping patients under treatment long enough to get results.

8. Paid social workers made part of the regular staff of all eye clinics so as to increase their efficiency in the prevention of blindness from glaucoma, uveitis, etc., and to economize the work of the physicians in charge, as fast as the necessary funds can be secured.

9. In schools, the pupils' eyes regularly examined, preferably by trained physicians; records kept showing the effect of the school curriculum on eyesight, and parents induced or compelled to furnish necessary eyeglasses or treatment for the eyes. If necessary, the state "neglect law" amended to make this possible. In the management of institutions, state and local authorities to set a standard of work for the preservation of eyesight.

Especially in reform schools and prisons, in which the inmates are shut away from the usual medical facilities, ophthalmologists regularly in attendance; and close cooperation secured between ophthalmologists, general physician and the probation officers having oversight over discharged prisoners. All male gonorrheal, and all syphilitic patients detained until cured.[40]

10. Classes, especially adapted for children with defective eyesight, organized in all large cities, not only to provide education for children not properly inmates of institutions for the blind, but also to aid in the preservation of their sight.

School children with the vision of both eyes defective, or with one eye practically blind, guided toward occupations relatively free from ocular injuries.

11. State birth registration laws amended to secure birth notification within three days, and preferably within forty-eight hours; and warnings as to the danger of ophthalmia neonatorum sent to all mothers immediately on receipt of birth notices.

Obstetric clinics promoted to furnish adequate nursing and medical service to the poor in large cities. Midwives trained, registered and supervised in cities in which their services are necessary.

A suitable prophylactic distributed free to all physicians and to midwives. The use of this prophylactic required at all births in lying-in hospitals or in the practice of midwives, and at least recommended strongly to physicians.

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[40] Massachusetts Revised Laws, Chapter 75, Section 48.

The symptoms of ophthalmia neonatorum defined by the American Medical Association as redness and swelling of the eyelids and unnatural discharge from the eyes, within thirty days of birth, and made reportable by physicians as well as nurses and parents.

Physicians, as well as midwives, prosecuted whenever necessary to secure observance of the reporting law; and physicians admonished by their state societies for failure to obey the law or to secure adequate treatment and nursing for serious cases.

Local boards of health given ample powers over reported cases, subject to the supervision and control of the state boards in requiring adequate standards of treatment. Minimum requirements defined by the American Medical Association as the attendance of an ophthalmologist, or of a physician experienced in the treatment of ophthalmia neonatorum, assisted in all but the lightest cases by at least one trained nurse.

12. Trachoma made reportable in all states in which it is prevalent, proper treatment insured under public supervision, and in case children are affected, special schooling provided.

13. Workers for conservation of vision to join with associations for sex education, etc., (*a*) in setting adequate standards of treatment for syphilis, congenital and acquired; (*b*) in raising the physical standards of marriage, and (*c*) in urging the federal government to extend to syphilitic patients the system of exclusion *at the port of embarkation,* now applied to emigrants with trachoma.

14. Legislation against holiday injuries, etc., and popular education as to the dangers of non-industrial injuries of the eye.

Cooperation with both employers and employees in the elimination of industrial injuries.

Team-work with the American Association for Labor Legislation, to secure the enactment or amendment of factory inspection and workmen's compensation laws, so as to provide for study of industrial conditions affecting eyesight, protection from injury and disease, and special compensation, not merely for "total and irrecoverable blindness" of either or both eyes, but also for practical blindness, defined as reduction of vision to one-tenth of normal with glasses.

15. A joint committee of the American Medical Association and the existing state organizations for the prevention of blindness and the conservation of eyesight to provide for interchange of information through periodic reports from each state, published in ophthalmologic journals and the *Outlook for the Blind,* and as soon as any vital demand is manifest, to promote a federation of all state committees and commissions actively at work for the preservation of eyesight.

ABSTRACT OF DISCUSSION

Dr. W. H. Wilder, Chicago: Two or three points in Mr. Greene's excellent address, I think, might bear reiteration to some who dwell where this work has not been done with such thoroughness as in Massachusetts. One of these points is the great importance of educating not only the members of the community but also the members of the profession. This is, after all, a campaign of education, and surely in some localities the medical profession is greatly in need of education along this line. In the past there has been altogether too much indifference shown to the recommendations and suggestions of specialists in the medical profession and it has been only by the representations of certain members that the public has been awakened to its importance. We now see that these efforts need further application and emphasis. The New York statute requiring that ophthalmia neonatorum be reported to a physician is the result of Dr. Howe's efforts. I think possibly eleven states now have a similar statute. We have such a statute in Illinois, but it needs enforcement, and furthermore, it needs some changes so that the board to whom it is entrusted will have more police power. The law in Illinois makes it incumbent on midwives to report sore eyes in a new-born child to the nearest physician. The inefficacy of such a law is shown, for often the physician does not know much more about the subject than the midwife. This excellent presentation illustrates the great importance of having some person or persons authorized as a board of commission to carry on this work. Such a commission should be legalized and it must have certain plenary powers which are not ordinarily granted to associations which are outside the government. In Illinois we have been working for some time to bring about, if possible, the establishment of an association for the conservation of sight and the prevention of blindness. We are trying to secure a commission for the blind and a recommendation was made to the state legislature a few years ago, but other questions, backed up with lobbies, took up more time and the medical laws were pigeonholed. It seems to me we must have a commission like that of Massachusetts or Ohio, whose duty it will be to see that births are promptly registered and a census of the blind taken.

Dr. Casey A. Wood, Chicago: The Council on Health and Public Instruction of the American Medical Association has taken up this important matter and has done the very things that Mr. Greene refers to. An endeavor will now be made to bring into use the machinery of the American Medical Association as a whole in correlation with the state societies. The committee appointed by the council will make use of the experience of such men as Mr. Greene and his commission in Massachusetts and apply the experience gained there to other states and I think much will be accomplished. This movement will be backed by a certain amount of money if the American Medical Association can be shown that actual work is being done. Incidentally it will help to relieve the country of a disgrace—the lack of vital statistics.

Dr. Thomas A. Woodruff, Chicago: If Mr. Greene will look up the law passed by Congress I think he will find that any employee injured in any factory has to be taken care of by that factory. The factory cannot settle with him. He may settle with the factory for $200, but the factory will have to take care of him the rest of his life if he is disabled and if he knows enough to obtain his rights. In regard to the education of the profession and the people, I think it is much more important that the common people, before being educated in this, receive education along the line of what is necessary to prevent blindness. That will soon educate the general practitioner in looking after them. In Illinois we recently formed an association for the prevention of blindness. Not only physicians, but also the laity have been asked to join, and a large preliminary organization has been formed. We have the Association of Commerce of Chicago interested in the education of the public and next fall shall have one evening devoted to the prevention of blindness. We have also enlisted the interest of the Chicago *Tribune,* which will, in the autumn, devote space to the consideration of this matter. We have enlisted the *Daily News,* which is giving a course of lectures in the public school buildings of the city devoted to various subjects. Some of these lectures will be devoted to the conservation of vision and the prevention of blindness and we are trying to make it a live subject.

Dr. Lucien Howe, Buffalo, N. Y.: A recent investigation has shown that a little over 50 per cent. of the cases of blindness are due to the two venereal diseases. It strikes me that we should join in the prevention of syphilis and gonorrhea and stop that stream at its source instead of trying to dam it back after it has gained headway. We should not mince matters at all in speaking to the public, but should have them understand what the principal causes of blindness really are.

MR. HENRY COPLEY GREENE, Boston: I wish to disclaim any intention of setting up Massachusetts as a model. I particularly hope that physicians organizing in other states will not copy our law, which is defective. The Ohio law is much better. It provides for preventive work definitely, instead of in merely general terms.

APPARENT ESOPHORIA AND ITS RELATION TO CONVERGENCE INSUFFICIENCY

H. B. LEMERE, M.D.
OMAHA

A class of cases has been observed in which there is an esophoria for distance combined with a marked insufficiency of convergence for near. In such cases, it has seemed to my colleague, Dr. J. M. Banister, and myself, that the paradox is entirely artificial, and we have considered the insufficiency for near as the essential state, and the seeming esophoria for distance as fictitious. To such instances of esophoria we have applied the term "apparent esophoria."

I at first used the term "pseudoesophoria" for this condition, but Dr. Savage called my attention to the fact that he had already used this term in referring to a different condition than that which I have described. To avoid confusion I have changed the term "pseudoesophoria," which I at first used in the classification of these cases, to that of "apparent esophoria."

Quoting Dr. Savage:[1] "When the far test shows orthophoria and the near test shows exophoria the error is pseudo in character. . . . The same explanation applies when there is esophoria in the far and exophoria for near." He therefore calls the condition we are considering a pseudoexophoria, and evidently considers the esophoria in the distance as the key to the situation and the source of trouble, and the convergence insufficiency called by him pseudoexophoria as of secondary importance. We believe exactly the reverse: that the convergence insufficiency is the true cause of the symptoms complained of.

It has been repeatedly noted in our practice that in this apparently paradoxical state, when the convergence insufficiency for near has been relieved, the esophoria disappears. The existence of this apparent esophoria should with reason be looked on as spasmodic and due to the increased effort required to secure a sufficient degree of convergence for the near point to avoid crossed diplopia. This effort cannot be sufficiently relaxed when viewing the test object at 6 meters, and the spasm remaining causes a tendency to crossing of the visual lines at a point short of the test object.

We have been so impressed with the truth of this explanation in these cases that we do not hesitate to correct the convergence insufficiency by operative treatment on the internal rectus or by prism exercises in the less serious cases. The treatment is carried out without regard for the apparent esophoria for 6 meters. As a case in point the following history is briefly quoted:

Mrs. H. C., aged 28 years, suffering from severe asthenopic symptoms, manifested under cycloplegia the following refractive condition:

R. + 25 D. S. ≍ + 25 D. cyl. axis 105.
L. + 25 D. S. ≍ + 25 D. cyl. axis 90.
Distance Esophoria with full accommodation 6°.
Distance Esophoria under cycloplegia 4°.
Convergence Insufficiency—crossed diplopia at 18 inches.

Ignoring the apparent esophoria, we shortened the internal rectus muscle of one eye by the tuck method with the result that perfect balance for distance was secured together with sufficient amplitude of convergence for comfortable work at the near point. The small degree of refractive error was corrected.

Much confusion may result from the difference in the type of the findings in our muscle tests for distance and near if this point is not borne in mind, namely, that the convergence insufficiency gives the key to the situation and that in attempts to secure relief our efforts should be in this direction, leaving the pseudoesophoria out of the scope of treatment.

We are convinced that this confusion in diagnosis and the resulting uncertainty of treatment come, in a large measure, from placing too much value on the stability of the muscle tests for distance, and therefore not giving sufficient consideration to the degree of the amplitude of convergence.

If we find an apparent esophoria when testing at 20 feet, and at the same time uncover a convergence insufficiency for the near point, we may as a rule suspect the condition of the esophoria to be spastic, and adapt our treatment accordingly.

In testing the distance balance we use the Maddox rod with the candle at 6 meters, finding the amount of unbalance by means of prisms. We also use the Stevens phorometer both by itself and in conjunction with the Maddox rod. In testing the near balance we use the Graefe dot and line, measuring the balance by means of prisms.

We have found, however, that these tests often give quite variable results; even more unreliable are the results of attempts to obtain the convergence at 6 meters by means of increasing strength of prisms till diplopia is reached. Banister in testing 100 healthy men found an average adduction for distance (6 meters) of 14.1. Yet if repeated examinations had been made in the same cases the convergence would have undoubtedly been trained so that the average would have shown a constant increase.

We make our diagnosis, therefore, from the results of the measurement of the amplitude of convergence, finding the punctum proximum by noting the near point of binocular vision for a dot, and estimating the punctum remotum by the power of divergence for 6 meters (Nagel).

The question will be raised whether in increasing the efficiency of the convergence we may not also increase the distance esophoria to such a degree that asthenopia or diplopia may result for distant vision; but this fear we have found to be groundless, the distance esophoria often disappearing as the convergence power for near is increased.

In our operative work for the increase of the dynamic power of convergence we have always operated to increase the power of the internal rectus and never to lessen the power of its opponent. We use the tuck operation of Savage with the catgut suture as recommended by Valk, with this modification which, I think, is original with us and which we have found very valuable.

After taking our tuck we do not tie the final knot till we examine the muscular balance with the light at 6 meters. If an overeffect is produced, we loosen and take a smaller tuck and test again. We have found, however, that the main difficulty with the tuck operation lay in those cases in which a very marked effect was desired. Here the deepest possible insertion of the suture, taking up the greatest possible length of muscle, is sometimes inadequate. If after testing we find this to be the case, we make an additional supplementary attachment with our original suture, which still has the needle on it. This can readily be done at this stage, as the muscle is now pulled forward by the first reefing of the suture. We have taken as many as two such reinforcements of our original suture, and consider this modification indispensable for this work. There has never been the slightest trouble in regard to the increased amount of catgut to be absorbed, and never has any hump or lump ultimately remained at the site of operation.

There are certain cases of convergence insufficiency in which useful working vision may be obtained only by means of operation. If one of these patients happens to have at the same time an esophoria for distance, this esophoria should not deter us from giving this patient relief by taking a tuck in the internal rectus.

I wish to acknowledge the kind assistance of my partner Dr. J. M. Banister. Many of our cases were worked out together and the ideas in this paper resulted from our frequent discussion of these cases.

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ABSTRACT OF DISCUSSION

Dr. G. C. Savage, Nashville, Tenn.: I think Dr. Lemere has done well in changing his expression "pseudo-esophoria" to "apparent esophoria." In my books I have used the expressions "pseudo-esophoria" and "pseudo-exophoria" as descriptive of conditions dependent solely on the relationship between the center of accommodation and the center of convergence, the former always existing in association with hyperopia, either increasing an intrinsic esophoria or showing an esophoria in both far and near when there is orthophoria, or showing itself in lessening an intrinsic exophoria. The glasses correcting hyperopia invariably cure this form of pseudo-esophoria. There is still another kind of pseudo-esophoria dependent on weak ciliary muscles, that is, ciliary muscles that have not been well developed. Exercise of the weak ciliaries will invariably cure this form of pseudo-esophoria. Of course this form shows itself in the near in excess of any esophoria that may exist in the distance, or in cases of orthophoria for distance, or even of slight exophoria for distance. Pseudo-exophoria, when dependent on myopia of high degree, shows itself only in the near and the same is true of that other form of pseudo-exophoria dependent on hyperdeveloped ciliary muscles. Pseudo-exophoria, whether dependent on one or the other of the causes mentioned, is never very great in quantity, that is, not more than six degrees, usually less. Higher degrees of exophoria in the near, when there is esophoria or orthophoria in the far, or a slighter degree of exophoria in the far, cannot properly be classed as pseudo-error. I have been led to think, and have so taught in "Ophthalmic Myology," that such cases are dependent on a subnormal development of the convergence center. I have seen cases, and doubtless some of you also have, in which there was no convergence center. The fourth conjugate center would make both eyes sweep to the right and the fifth conjugate center would make the eyes sweep to the left, showing that the interni were not at fault, when there was complete absence of convergence power. If the convergence center can be absent and if it can be hyperdeveloped, then this center, which is the third conjugate center, can be subnormally developed. This would necessitate a great amount of work of such a center in converging to procure binocular single vision in the near. If there are more than six degrees of exophoria in the near then a part of this exophoria is intrinsic and would show itself in the distance if there were no spasm of the interni to counteract it. The fact that Dr. Lemere has found shortening the interni curative in cases of esophoria in the far with exophoria in the near is proof, to my mind, that the esophoria was spasmodic. If it had not been spasmodic, he would have increased the esophoria in the far while lessening the exophoria in the near. I have gone over the last 200 cases of refraction on my record books, and have found some unexpected things. There were 4 cases of esophoria in the far with exophoria in the near, 50 cases of orthophoria in the far and exophoria in the near, 10 cases of exophoria in the far and greater exophoria in the near, 17 cases of esophoria in both far and near, 41 cases of hyperphoria existing alone or complicating lateral orthophoria or some lateral error, 68 cases of orthophoria, far and near, 1 case of paralysis of one or more lateral muscles and 9 cases of esotropia; there were no cases of exotropia. In the 200 cases there were 9 cases of blindness in one eye.

It is not against Dr. Lemere's theory that I have found orthophoria in the far and exophoria in the near, for in these cases there may have been an intrinsic exophoria corrected by a spasm of the interni, nor is it against his theory that some of my cases had exophoria in the far with more exophoria in the near, for the lessened exophoria in the far may have been due to a spasm of the interni. My treatment of the cases for want of convergence has not been operative but by means of exercise only. The exercise which I have resorted to has been fully set forth in "Ophthalmic Myology" as "the candle exercise." The patient lights a Christmas-tree candle, and holding it at arm's length, fixes both eyes on the blaze, continuing this fixation as the candle is brought within 7 inches of the eyes. Then the eyes are closed, the candle moved to one side and the gaze immediately thrown into the distance. I begin with three movements of the candle the first night before going to bed and add one every night until fifteen movements have been reached, and after continuing the fifteen movements at one exercise, for one month, just before going to bed, I direct the patient to also move the candle ten times toward himself every morning. This exercise, when faithfully followed, in most cases finally brings a cure which doubtless comes from a development of the cells constituting the center of convergence, also developing the interni so as to make them respond more readily to a slighter stimulus. If the operation of muscle-shortening will do the work, then the patient is saved much time and annoyance. The suggestion growing out of Dr. Lemere's experience is worth considering. I am proud of the shortening operation described in his paper, because forty of my colleagues have claimed it, the first one to make the claim being Dr. Valk of New York. I quote the following from a letter received from Dr. Valk written Aug. 15, 1895. "Dear Doctor.—Your letter is just received. I looked up the editorial you referred to in the *Record*, March, 1893, and now have no doubt that you are entitled to the credit of what seems to be an excellent operation. . . . I will gladly do all I can to correct the matter, and should I refer to it again will always give you credit for it." The other claimants, as a rule, have not made such clear and clean acknowledgements. To the fortieth man, I wrote a few days ago: "You are the fortieth to claim the operation of muscle-shortening. I do not know what the other thirty-nine will think about your claim, but yours is as strong as theirs, yet none of you have the slightest claim to the operation, for it is my own."

Dr. S. D. Risley, Philadelphia: Many years ago I had the audacity to write that we should probably never discover a law for ocular imbalance for the following reason: If we accept two emmetropic eyes, with normal acuity of vision in each, with a physiologic range of accommodation and convergence as the ideal condition for comfortable vision, then any departure from this ideal condition must be regarded as a defect or an abnormality. Examination of a large number of hatters' forms will show great variety in the form of the human skull and the rarity of a model form. The examination of a large number of dried skulls showed that there was a definite relationship between these abnormal varieties in the outline of the skull and the shape of the orbits and the bony sinuses surrounding the orbital cavities. It is reasonable to suppose that, during development in the anomalous-shaped orbit, certain modifications would occur in the form of the eyeballs which would change their dimensions and consequently alter their radii of curvature, and would also lead to changes in the length and line of direction of the optic nerve and the origin and attachment or length and direction of the ocular muscles—conditions, one or all of which, would lead to more or less marked disturbance of motility and in many complex ways modify the condition of binocular vision. Since there is an infinite variety in the possible deformities in the bony skull so an infinite variety of abnormalties of binocular balance is possible, which, so far as I see, can have no relationship to fusion centers based on undemonstrable hypotheses. We can, however, from a study of well-known physiologic factors, separate the cases of binocular imbalance into two groups, which I designate as relative and absolute insufficiencies. These relative insufficiencies have been accounted for in different ways in this discussion, and are, I believe, often misunderstood, but were recognized and correctly explained by Donders in his great treatise. For example, a child is born with hypermetropia, with or without astigmatism. Experience has taught him to disassociate the convergence and accommodation, that is, he is required to use a part of his accommodation even for distant vision where convergence is not required. If the hypermetropia, for example, equaled 2 D., he must use 2 of accommodation and no convergence, while reading at ⅓ of a meter he must use 5 of accommodation and only 3 of convergence. When his hypermetropia is corrected by a +2 D., the habit of a life-time is disturbed and he is compelled to learn a new trick of vision. He must either relax his accommodation to secure clear vision at a distance, and see double, or secure single vision at the expense of a blurred image in each eye. If the child sees clearly he has a relative insufficiency of the interni. If he secures single vision, he has a blurred image and usually a relative esophoria. These are the cases which may be corrected with prisms by well-directed practice. The absolute insufficiencies, however, belong to an entirely different group and are dependent on faulty attachments of the muscles to the globe itself and no amount of exercise with prisms or otherwise is of permanent value.

DR. EDWARD JACKSON, Denver: If we take brain centers in the physiologic sense, somewhat similar to that in which the terms x and y are used in algebra, they offer a convenient way of working out such problems. They simply mean that impulses converge from all parts of the nervous system to do certain things, and what has been observed in pathology, interference with function by destruction of a certain part of the nervous system. Thus understood the terms Dr. Savage has brought into the discussion explain better than any others I could frame the class of cases to which Dr. Lemere has called attention. An overworked portion of the nervous system, inadequate to the work of convergence that is required of it, will explain a tendency to spasm. I do not know how many members of the section have weeded gardens, but when I was about 6 years old it is said I objected to it because I had to "slant my back" so much. A strained, difficult position kept up for some time requires increased time and effort to resume the normal attitude. I think these cases of esophoria at distance with insufficient convergence belong in that category. The paper does not state the patients' occupation or how the eyes were used for near work. But certainly a large number of patients overwork the convergence in their habitual occupations and I take it that many of this series are cases of inability to relax the convergence because it is weakened by overwork.

DR. CASEY A. WOOD, Chicago: Accommodative spasm is often a matter of overworking a tired-out muscle system. When convergence and accommodative power are not well balanced, and fatigue of one or the other is present, an overinnervation occurs in an attempt to overcome the difficulty. But this, far from improving the situation, only adds to the patient's discomfort and we have the symptoms of accommodative (and perhaps) convergence asthenopia.

DR. OSCAR WILKINSON, Washington, D. C.: Apparently there is a discrepancy in Dr. Lemere's statement. He first says: "The treatment is carried out without regard to the apparent esophoria for 6 meters." A little further on he says: "After taking our tuck we do not tie the final knot until after we examine the muscular balance with the light at 6 meters." If he takes no notice of the esophoria before the operation why should he take note of it during the operation? Why should he not make the test near if he wishes to test the amount of correction of the muscle? I agree with Dr. Risley in regard to the effort to relieve this class of cases by milder means. Of course, once in a great while we are compelled to operate, but in the matter of exercises, as pointed out by Dr. Savage, I use a black dot on a white paper and I get results, notwithstanding Dr. Savage's claim that it is not so effective as the candle, and I use it more frequently. The only question is in regard to the frequency of use. If you overexercise, the muscle becomes fatigued and its strength is not increased. One thing should be borne in mind: When you have an exophoria for near you cannot use as strong plus lenses on that patient as in a normal case. You have to reduce the plus lens for reading about one-half diopter. I tell the patient not to hold the print so close to the face, but farther away than the average person would. Oculists and opticians have a tendency to use large lenses. In this class of patients you must specify smaller lenses so that you can get the centers of the lenses a little within the pupillary centers of the eyes. This greatly relieves the strain on the convergence.

DR. C. D. WESCOTT, Chicago: In my practice I have been cautious about doing any operation on the eye muscles until every other means has been exhausted to make the patient comfortable. I hope Dr. Lemere does not wish to give us the impression that he has done the advancement or tucking operation without first attempting to relieve these cases by exercises. I have found that by painstaking refraction under cycloplegia, careful correction of the hyperphoria and training of the convergence I have been able to avoid many operations of this character. In the cases of absolute insufficiency we must operate, but the number in which we can get results by careful refraction and muscle-training is far in excess of those in which operation is needed.

DR. GEORGE H. PRICE, Nashville, Tenn.: Whether there are centers which control certain muscles is a question already decided for us by the physiologists and we have been working on this for some time, developing the exact conditions under which these functions are brought into action. If the original impulses in infancy were away from a direct line which should be established for normal physiologic function of any set of muscles, and if in trying to correct them we get into any little bypath, we have started wrong and it takes a long time to correct it. Deformities of the skull, spoken of by Dr. Risley, would account for this in a measure but I have seen all sorts of shapes and it does not necessarily mean that it determines the muscle condition of the eye. The centers are subject to education.

DR. H. B. LEMERE, Omaha, Neb.: In reply to Dr. Risley I may say that my whole endeavor has been to simplify matters rather than obscure them. I am proposing a simple practical solution of this problem. There are certain patients who, even after careful correction of refractive error under cycloplegia, still suffer from asthenopia. If this is due to insufficiency of convergence we always try, if practicable, to give proper exercises. This case illustrates the point: A boy aged 12, error +.50 D. sph. both eyes, unable to attend school. He was absolutely unable to converge nearer than 18 inches; distance orthophoria. Exercise could not be enforced. Operation gave good working convergence. I think that Dr. Savage's suggestion of a small candle for near exercise in convergence is excellent and will stimulate the convergence power better than the pencil ordinarily used. I thoroughly agree with Dr. Risley in considering many cases due to the altered relation between convergence and accommodation and this altered relation is always taken into consideration in the treatment. Dr. Wilkinson made a just criticism. I noticed the seeming discrepancy in the paper. The internal rectus, However, after the handling of the operation may be assumed to have lost its spasm and any double vision would then indicate an over effect. Many opthalmologists would refuse to operate for insufficiency of convergence with esophoria in the distance and the patient would get no relief. I wish to state most emphatically that we do not operate unless we are satisfied that exercise will not correct the insufficiency. We do not rashly advise operation. The few patients on whom we operate could obtain relief from their prostrating symptoms in no other way. They should be relieved because if help is refused they go from pillar to post, have their glasses eternally changed, and become prey for quacks.

OCULAR VERTIGO

ALLEN GREENWOOD, M.D.
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Vertigo is produced by some disturbance in the functions of orientation and equilibration which results in a disturbed conception of our position in space, and is objective when objects about the patient seem to move, and subjective when patients feel themselves to be in motion.

Duel[1] says:

> The function of orientation is a nice sense presided over by the vestibular apparatus; it is intimately associated with equilibration and brings this about by impressions through Deiters' nucleus to the oculomotor centers on one hand and to the motor neurons of the cord on the other.

Physiologists are divided into those who assert that all vertigo is essentially auditory in location, and those who believe that vertigo may result from disturbance of the cerebellum, entirely without the intervention of the vestibule and canals. The weight of opinion, however, seems to be in favor of the former view.

We know that the impulses conveyed from the eyes by way of muscle-controlling nerves are correlated in the cerebellum, and that in this way the function of equilibration is maintained; and we must remember that the portion of the vestibular nerve which arises in Deiters' nucleus communicates nerves to the nucleus of the motor nerves of the eye-muscles, so that labyrinthine abnormalities must have a disturbing influence on the ocular muscles. This intimate reflex association of the eye-muscles with the labyrinth has been carefully worked out by the otologists, to whom we are indebted for most of our knowledge concerning the influence of the aural apparatus on ocular movements.

Bartels[2] laid bare in the rabbit the externus and internus muscles, and after removal of the eyeballs and the remaining muscles, he determined the movement of these muscles during and after circulatory movements, and also after thermic stimulation of the ear. The curves so obtained showed how both the slow and rapid phases of nystagmus result from the contraction of one muscle contemporaneously with the perceptible relaxation of the antagonist. "These observations indicate the existence of a continuous tonic influence on the ocular musculature setting out from the ear."

Rapid rotation of the head, with a sudden stop, causes disturbances in the fluid of the semicircular canals, with a resulting vertigo and an accompanying nystagmus. Different varieties of the latter are produced according to which canal is most nearly horizontal, and thus its fluid most subject to the centrifugal force. These differences are obtained by holding the head of the person rotated erect or bent backward or far forward.

The thermic test also produces a vertigo with rotating nystagmus, with cold producing a rotation opposite to that of the ear experimented on, and heat the reverse.

For a complete study of the different forms of nystagmus produced by labyrinthine rotation and thermic tests, reference should be made to Scott's[3] tables.

In view of the foregoing may we not justly reason that a reverse reflex action can take place? That a particularly excessive and abnormally directed action of the ocular muscles, especially those concerned in ocular rotations, requires unusual and disturbing stimulation of the motor oculi nerves for its accomplishment is evident; and may not this unusual action of the motor oculi nerve centers cause reflexly, through Deiters' nucleus and the cerebellum, an unusual stimulation of the labyrinthine branches of the eighth nerve and thus cause vertigo? This ocular reflex stimulation of the nerve-endings in the labyrinth must ordinarily be much less than the stimulation produced by the rotation and thermic experiments, just as ocular vertigo is of a comparatively mild character, especially when compared with that symptom-complex known as Ménière's disease.

Davis[4] pointed out that several observers had mentioned that a rotatory vertigo and nystagmus may occur during convalescence in paresis of the eye-muscles, and says that "in such cases the mechanism of the vertigo and nystagmus may be plausibly explained by assuming that the labyrinth is reflexly influenced by the stimulation resulting from the innervation of the eighth nerve, communicated through Deiters' nucleus to the oculomotor muscles."

It is difficult for those who have not experienced severe attacks of vertigo, or been intimately associated with patients subject to such attacks, to appreciate the amount of distress and incapacity produced. In a nervous patient a nearly constant unsteadiness, or frequent attacks of dizziness, will incapacitate to a marked degree and result in actual phobias so that such patients will not venture from their rooms alone.

During recent years an increasing number of patients so afflicted, having tried in vain the aid of the internist and the otologist, have frequently turned to the ophthalmologist and found relief. Patients with vertigo without indications of aural, digestive or other disturbances, are now being sent to the ophthalmic surgeon, or voluntarily requesting his services, with the hope of relief from this occasional, but very distressing symptom of eye-strain. One writer states that eye-strain is the least frequent cause of vertigo; but this is evidently a fallacy due to the fact that ocular vertigo is often less severe than other forms, and is often cured by glasses at the presbyopic age, without the patients' having laid stress on the symptom, not believing it to be caused by their eyes. The future will probably show eye-strain to be one of the commoner causes.

About three years ago I became much interested in this subject and began tabulating my cases, and since that time I have seen nineteen in my private practice. Prior to that time I had, of course, seen cases of ocular vertigo; but not having kept special records in these cases, I have

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1. Duel, A. B.: Abstract of discussion to article by Davis, George E., The Journal A. M. A., Oct. 8, 1910, p. 1277.
2. Bartels: Arch. f. Ophth. (Graefe's), lxxvii, 531.
3. Proc. Roy. Soc., April, 1909.
4. Davis, George E.: The Present Status of Vertigo Considered from a Diagnostic Standpoint, The Journal A. M. A., Oct. 8, 1910, p. 1272.

decided to report only those seen during the past three years, and in this small group of cases I have included only those in which the patients were sent by physicians, or came of their own volition, for the relief of vertigo. Of course, in many cases of asthenopia there will be a history of car-sickness or slight tendency to vertigo, though only as minor symptoms; but in all the cases, the histories of which I shall give below, marked vertigo was the chief or only symptom for the relief of which these patients consulted me, and all cases complicated by aural disturbances or marked internal diseases have been excluded; in fact, most of the patients had been previously examined by otologists and found free from aural defects, or had been treated by their family physicians for general disturbances.

That which influenced me to report these cases was the almost uniform type of refractive error which was found as the apparent cause of the vertigo, and the uniformly good results following the wearing of correcting-glasses.

CASE 1.—Miss S. M. F., aged 43, sent by her family physician because of a constant and annoying dizziness. The patient says that this is not sufficient ever to cause her to fall down, though she frequently has to catch hold of things to steady herself if she looks quickly from one place to another. The dizziness comes on in the morning after she has been up and about a very short time, and if she lies down and closes her eyes for a time it passes away. Examination of the eyes reveals the following: Right eye with +.75 sph. with +.62 cyl. ax. 100,° vision equals 20/20; left eye with +1. sph. with +.50 cyl. ax. 70,° vision equals 20/20. There is 1 degree of esophoria with the glasses on. The fundi are normal. These glasses were given for constant use, and she reports that since wearing them there has been no dizziness.

CASE 2.—Dr. E. E. H., aged 48, wearing the following bifocal glasses: +1.50 sph. with +1.00 sph. wafer added, complains of being dizzy most of the time, frequently with attacks of dizziness that incapacitate him, and at such times things seem to be whirling around. Dizziness quickly passes off when he lies down and closes his eyes. There are no signs of aural disturbance, and this physician was inclined to ascribe his dizziness to a beginning arteriosclerosis, and had made up his mind that treatment would probably avail him nothing. Examination of the eyes revealed: right eye with +2 50 sph. with +1.00 cyl. ax. 165,° vision equals 20/20; left eye with +3.00 sph. with +.50 cyl. ax. 180,° vision equals 20/20; +1.75 sph. added for near. Fundi normal, and with glasses he has orthophoria. Within forty-eight hours after these glasses had been put on, the dizziness had entirely disappeared, and during the past nine months there has been no sign of return.

CASE 3.—Mrs. F. A. B., aged 50, has a slight dizzy feeling practically all the time which commenced several years ago and has steadily grown a little more troublesome. She never has any bad dizzy spells and never has to hold on to things for support. Right eye +.50 sph. with +1.25 cyl. ax. 95,° vision equals 20/20; left eye +.87 sph. with +1.00 cyl. ax. 75,° vision equals 20/20. With these glasses on she has only 1 degree of exophoria. A +2.25 sph. was added to the above for the strength of the wafer. The fundi were normal. During the year that she has worn these glasses there has been no return of the vertigo.

CASE 4.—Miss R. P., aged 32, referred by her family physician for dizziness which is practically constant when she is up and about. By spells, things, as she expresses it, "whirl all around" her, so that she has to sit down or steady herself by some support. There are no evidences of any aural trouble. Right eye shows +.25 sph. with +.25 cyl. ax. 45°; left eye +.25 sph. with +.12 cyl. ax. 70.° With these glasses on she has absolute orthophoria. The fundi are normal. During the fifteen months that she has worn these glasses there has been no return of the dizziness.

CASE 5.—Mrs. E. M. B., aged 33, had been wearing glasses for two years, both eyes having a +2. sph. During the past three months there has been a steadily increasing feeling of dizziness and, as she expresses it, a constant feeling as though she were being pulled toward the right side. This is especially marked on any attempt to use her eyes, so that sometimes she is more comfortable if she closes the left eye entirely. Examination shows that the right eye will take a +4.00 sph. and the left eye a +4.25 sph. With these she gets a vision of 20/20, and has an esophoria of 4 degrees and left hyperphoria of 1 degree. She gets clearer vision with —.37 sph. added to the above. On account of the esophoria, however, she was given a slight overcorrection. During the several months that the patient has been wearing these glasses there has been no return of the dizziness, and she feels much better in every way. She has the same hyperphoria as before.

CASE 6.—G. A., a rather anemic girl of 11, came with the following history: She has been kept out of school for a number of months, on account of nearly constant dizziness, and during the past two months she has had three attacks in which she has fallen down apparently unconscious, and the family physician had made a diagnosis of epilepsy. Any attempt to use the eyes for close work causes them to ache and increases the dizziness. She is wearing a +1.00 sph. for both eyes which has not improved matters. After examination with a mydriatic the following glasses were prescribed: right eye +4.00 sph. with a +1.50 cyl. ax. 95°; left eye +3.75 sph. with +1.50 cyl. ax. 85.° She has orthophoria and no fundus trouble. The wearing of these glasses immediately stopped the dizziness and there have been no recurrences of the attacks for three years, except once or twice, when she has for some reason or other been without her glasses for several days.

CASE 7.—Miss E. F., aged 21, seen Jan. 2, 1913, with a history that evening study makes her eyes smart and burn; on looking around at such times she is apt to be very dizzy. Examination under a mydriatic gave right eye —.62 cyl. ax. 80°; left eye —.50 cyl. ax. 90.° Orthophoria and normal fundi. The wearing of these correcting-glasses has entirely eliminated the dizziness.

CASE 8.—Mr. A. F. M., aged 58, during the past two or three years has had increasingly frequent attacks of dizziness, and lately he waked up every morning with severe headache. There is no intranasal disturbance or sign of aural trouble, and no demonstrable arteriosclerosis. Right eye shows +.75 sph. with +.87 cyl. ax. 160°; left eye shows +.75 sph. with +.62 cyl. ax. 20°; takes +2.50 sph. added for correction of the presbyopia. Wearing these glasses has entirely prevented the headache and dizziness.

CASE 9.—Mrs. F. W., aged 54, for several years has been having gradually increasing attacks of dizziness accompanied by headache. She often wakes up with a pain in the back of her head which increases as the day advances and usually results in a good deal of vertigo, though she has never had it bad enough to render her unable to walk about. Examination of the right eye shows a —.75 cyl. at an axis of 5,° left eye —.75 cyl. at an axis of 15.° With these glasses she has a vision of 20/20 in both eyes. She takes a +2.25 sph. added for reading. No heterophorias. The fundi show a very slight arteriosclerosis, but the wearing of her distance glasses constantly, with reading-wafers, has entirely stopped dizziness during the past nine months.

CASE 10.—Mrs. J. M., aged 20, sent to me by her family physician with the hope that glasses would remove the vertigo which she has had for several months. Examination of the eyes shows +.25 cyl. ax. 90° in both eyes. The fundi were normal and the muscle balance good. The wearing of this slight correction for astigmatism, constantly, has entirely stopped the vertigo, and there has been no return of it during the past year and a half.

CASE 11.—Miss E. H., aged 32, sent by her family physician on account of a nearly constant, but slight dizziness. Examination of the eyes shows right eye +.25 cyl. ax. 50,° left eye +.25 cyl. ax. 120,° both eyes having a vision of 20/20. Fundi normal and muscle balance normal. The wearing of these glasses has entirely relieved the patient of all symptoms of dizziness during the past two years.

Case 12.—Mr. A. C., aged 36, sent by his family physician with the report that for several months any use of his eyes had produced discomfort ending in nausea and dizziness. Right eye shows +.25 cyl. ax. 30,° vision 20/20; left eye —.37 sph. with +.75 cyl. ax. 105,° vision 20/20. Fundi normal and no heterophorias. The wearing of these glasses has entirely removed all signs of the previous trouble.

Case 13.—Mrs. G. S., aged 29, for the past year and a half has been very dizzy some part of nearly every day. This dizziness has been increasing so that at present she is dizzy most of the time, though not to such an extent as to incapacitate her. She is especially dizzy after any attempt to concentrate her vision, and at such times her eyes feel strained, but she has no headache. Examination shows the right eye +.37 cyl. ax. 135,° and left eye +.87 cyl. ax. 85.° For the two years that the patient has been wearing these glasses there has been no return of dizziness. In this case there are no signs of muscle trouble and nothing to be seen in the fundi.

Case 14.—Mrs. J. C., aged 39, has been subject to headache and dizziness ever since she was a little child. Frequently when looking quickly from one object to another, she becomes so dizzy that she has to hold on to things to steady herself. Examination shows right eye +.50 sph. with +1.00 cyl. ax. 180°; left eye +.50 sph. with +1.50 cyl. ax. 175.° Fundi normal and muscle balance good.

Case 15.—Miss E. M., aged 22, has been growing nearsighted for several years until at present it is difficult for her to see car signs clearly. The last year or two she has been having increasingly frequent attacks of headache and dizziness. Examination shows right eye —.75 sph. with —.25 cyl. ax. 70°; left eye —1.12 sph. with —.25 cyl. ax. 110.° Fundi are normal and muscle test shows orthophoria with these glasses on. During the three years she has worn these glasses there has been no return of the dizziness.

Case 16.—Miss S. M., aged 24, for several years has done fine watch work, and during that time has had increasingly frequent attacks of dizziness and has a slight amount of vertigo all of the time while at her work. The patient has never worn glasses. Right eye shows +.75 sph. with +3.25 cyl. ax. 60,° vision equals 20/20; left eye +3.75 cyl. ax. 95,° vision equals 20/20. Fundi normal and muscle balance good. As soon as these glasses were put on the dizziness almost immediately disappeared, and during the year that she has worn them there has been no return.

Case 17.—Mr. H. E., aged 40, has for several years been subject to spells of dizziness, and at times he has to stand still for a moment before he dares to move ahead. This he finds is especially so when entering a light room from a dark. Right eye —.25 sph. with —.37 cyl. ax. 150,° vision equals 20/20; left eye +.50 sph. with —.62 cyl. ax. 105,° vision equals 20/20. Muscle balance and fundi normal.

Case 18.—Mr. W. C., aged 56, greatly troubled by nausea and dizziness, particularly when walking about. Moving objects almost always make him dizzy. Right eye +1.00 sph. vision equals 20/20; left eye +.75 sph. with +.25 cyl. ax. 105,° vision equals 20/20. Has 1 degree of exophoria, and the fundi are normal.

Case 19.—Miss E. C. D., aged 53, sent by her physician, who himself furnished Case 2 of this series. She has a great deal of dizziness, is unable to turn her head and look about without becoming dizzy, and at times has nausea and vomiting lasting several hours. O. D. +.62 cyl. ax. 80°; O. S. +.50 cyl. ax. 100.° No fundus trouble; with these glasses the patient has 0.5 degree of esophoria; +2.25 sph. was added for bifocal, and after wearing the glasses several months the patient reported no return of dizziness or nausea.

A study of these cases shows that out of the nineteen patients there were seventeen having astigmatic eyes, with one or both axes oblique, fifteen showing asymmetric axes, and seventeen with slight anisometropia. Only one case had an insufficiently corrected simple hypermetropia of high grade, and this one case was also the only one showing a hyperphoria; but in this case the correction of the hypermetropia caused the vertigo to disappear, with the hyperphoria still remaining.

We all know that cases of vertigo result from muscular palsies, as painted out by Davis[4] and Croft;[5] but I have personally seen none since I began tabulating my cases. High grades of heterophoria are also considered to be the cause of a certain number of cases, but during the period mentioned previously none of these has come under my observation, though I have seen a good many patients with marked heterophorias and have questioned some of them in regard to dizziness without eliciting any history of vertigo worthy of notice. In view of this I feel justified in stating that in all probability the majority of the cases of ocular vertigo result from moderate errors of refraction, and usually occur in patients whose eyes show astigmatism with asymmetric oblique axes.

In other words, those patients whose eyes, when used, cause head-tiltings and disturbances to the normal ocular rotations and movements may produce vertigo from reflex irritations of the labyrinthine nerves the reverse of those conditions of rotary nystagmus produced reflexly by labyrinthine disturbances.

I find that most of the reported cases of ocular vertigo have occurred, as have mine, in patients with astigmatism with oblique axes, including one of Dr. Dixon's[6] cases, in which the patient, who had no astigmatism, was wearing +.75 cylinders placed at oblique and asymmetric axes; the removal of these glasses probably had as much to do with the cure of the vertigo as the wearing of the proper hypermetropic correction.

Croft[5], in his article on ocular vertigo, mentions ocular-muscle palsies as occasionally the cause of vertigo and also possibly heterophorias, but ascribes the majority of cases to errors of refraction.

As the result of our experience we all are frequently warning patients for whom we have prescribed cylindrical glasses with axes oblique to expect some distortion of images and disturbances of orientation, and probably resulting vertigo. It often happens that such patients have to get used to their glasses very gradually owing to this. Minus cylinders, at oblique but nearly horizontal axes, will cause a receding and tipping of images looked at, such as the floor or curb-stone, while plus cylinders, so placed, will produce the reverse appearance, and the effort on the part of the eyes to overcome this difficulty of orientation produces the vertigo. The following case illustrates this well:

> Mrs. B., aged 39, was given O. D. —.37 sph. with +1.50 cyl. ax. 45°; O. S. —.25 sph. with +1.00 cyl. ax. 135.° Fundi and muscle balance normal. With these glasses she obtained great relief when using them for reading, but the minute she attempted to look about the room, or walk about, she experienced extreme vertigo, so that it was impossible for her to wear the glasses constantly at first.

I have seen + .25 cylinders at axes slightly above the horizontal produce just as marked vertigo as seen in this case, and I find that when patients become accustomed to such glasses the removal of them will often cause temporary vertigo.

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[5] Croft: Boston Med. and Surg. Jour., September, 1905.
[6] Dixon: Ophth. Rec., March, 1907.

The accurate adjustment of the eyes, by normally acting ocular muscles and fusion centers, is essential for binocular vision, judgment of distances, and especially perspective. Eyes having astigmatism with the meridians of greatest and least curves oblique, and eyes having cylinders with axes oblique placed in front of them have this perspective disturbed, and the resulting unnatural activity required of the oculomoter nerves and the higher fusion centers may cause reflex vertigo or possibly vertigo independent of the labyrinths.

ABSTRACT OF DISCUSSION

Dr. **Albert E. Bulson, Jr.**, Fort Wayne, Ind.: In a study of the subject of vertigo it should be remembered that the labyrinth is not the only source of impulses which help to maintain equilibrium as evidenced by the fact that destruction of the labyrinths produces only temporary loss of balance. Braun and Friesner, in a recent work, say that the other sources of impulses for the preservation of our equilibrium perform the function of the labyrinth vicariously, or what is more probable, the centers in which all these impulses are gathered accommodate themselves to the loss of the normal influence of the labyrinth, and a compensation results. Just how the impulses from the labyrinths share with those from other sources in maintaining our balance, is a difficult matter to determine, and in the present state of our knowledge is largely speculative. Without doubt, however, all of these centripetal impulses combine harmoniously and partly reflexly, at all events automatically, to establish our balance without our realization of the processes involved. Every disharmony in these impulses which serve to maintain our equilibrium causes, if sufficiently pronounced, a marked disturbance in balance. The labyrinth is probably always active, in the sense that it constantly sends to the centers impulses acquainting us with our position in space, and also with the changes in our position. Under ordinary circumstances reflex stimuli are constantly aroused with perceptions of our position and its changes, whose purpose it is to cause the eye muscles and the body muscles to accommodate themselves to the conditions that call forth these perceptions. It is an established fact that the labyrinths are in relation with the central nuclei of the muscles of both eyes and a powerful impulse aroused in one labyrinth, even after the complete destruction of the opposite labyrinth, is capable of causing both eyes to execute nystagmic movements in all planes, and directed either to the sound side or to the other. All the centripetal impulses, whose purpose it is to maintain our equilibrium, are gathered together in the cerebellum, so that the latter may be considered, in a sense, the center for the labyrinth. There probably is no single, definite center on which all of the centripetal impulses exert their influences. The cerebellum receives centripetal impulses from the labyrinth, sensory impulses from the muscles and joints, and visual impulses from the eyes and it sends out to the muscles of the head, trunk and extremities motor impulses, the purpose of which is to maintain the equilibrium of the body. In the cerebellar cortex the motor impulses meet the centripetal impulses from the labyrinth, the muscles, the joints and the eyes, and are there acted on in such a way as to become effective in maintaining the equilibrium of the body Vertigo, in itself, is of little value in determining the nature of the underlying affection, for, as stated by Mills, irritation may be reflected to the apparatus of equilibration from almost any part of the body, near or far. It is plausible, therefore, to assume that ocular vertigo, which is reflex, may, as pointed out by Dr. Greenwood, be a reverse action in which the irritation produced by accommodation strain and muscular insufficiencies, may produce an abnormal stimulus on a more or less non-resisting equilibratory apparatus in which the disharmony is manifest in either the labyrinth or cerebellum. Posey states that any uncorrected error of refraction, presbyopia or heterophoria, in an individual predisposed to nervous affections, may be responsible for an ocular vertigo and he quotes observers who state that vertigo occurs in about 12 per cent. of all cases of asthenopia, including both accommodative and muscular, in which no disease of the visual apparatus can be shown. It is common also in those who have asthenopia from wearing inaccurately adapted lenses, either in the strength of the lens or in the adjustment of the axis of the cylinder. Posey refers to the joint papers of Thomson and Weir Mitchell, who point out that vertigo may be a symptom of eye-strain, a fact that is being verified in the routine work of probably all oculists. In my own experience the cases of ocular vertigo, which are relatively frequent, have usually occurred in patients who belong to the type known as neurotic, or whose resisting power has been lowered by disease, overwork, dissipation or failure to observe the ordinary rules of hygienic living. The vertigo is usually associated with one or more other nervous symptoms, including headaches, nausea, irritability, etc. The attacks are brought on by eye-use and it is my experience that they occur as frequently under accommodative effort for distance vision as they do for near vision. The attacks are frequently preceded by headaches, nervous irritability or a sense of weariness or oppression. Usually the amount of error is small and almost invariably it is of the astigmatic type with axes off from the vertical or horizontal planes. The existence of slight heterophorias has seemingly had little influence in the production of the vertigo, inasmuch as the correction of refraction in the majority of cases has been sufficient to relieve the vertigo, although occasionally a prism, more often to correct a hyperphoria, has been required. Ocular vertigo is invariably relieved by cycloplegia, or by closing the eyes for a time, either while sitting or lying down, and this forms a valuable diagnostic indication as to the kind of vertigo we are dealing with. It should be noticed that practically identical errors will produce no symptoms in some persons whereas in others they will produce the most distressing symptoms. The reason for this is easily explained by the lack of nerve balance possessed by a class of patients, whom, for want of a better term, we call neurotics. The recognition of an uncorrected error of refraction, often seemingly of little consequence as the etiologic factor in the production of some distressing forms of vertigo, is deserving of the emphasis placed on the subject by Dr. Greenwood.

Dr. **G. C. Savage**, Nashville, Tenn.: Dr. Greenwood has not given too much emphasis to the fact that an oblique astigmatism produces vertigo. It is also capable of producing all the other symptoms that come from astigmatism which is not oblique. Lenses correcting the oblique astigmatism ultimately bring relief from the vertigo and the other symptoms caused by the astigmatism. The lenses given for the correction of astigmatism which is not oblique gives perfect satisfaction at once, but the lenses correcting oblique astigmatism are always a source of peculiar annoyance for a greater or less length of time. Oblique astigmatism, with the meridians of greatest curvature diverging above, whether the astigmatism be myopic or hyperopic, so long as not corrected, causes the superior oblique muscles to tort the eyes inward for the purpose of harmonizing distorted images. This action on the part of the superior oblique muscles does not cease at once when the correcting cylinders are given, but the time required to become accustomed to such lenses is usually very short. In all cases of oblique astigmatism with the meridians of greatest curvature converging above, whether the astigmatism is myopic or hyperopic, so long as uncorrected, it compels the inferior oblique muscles to tort the eyes outward, in order to harmonize the distorted images. The correcting cylinders at once relieve the distortion of the images but the old habit of action on the part of the inferior obliques continues for a considerable time in nearly all cases and so long as this habit continues the patient is annoyed by the false appearance of things. In the former class of cases the patient will have to go up hill, for a level surface will be slanting towards him, but in the latter class of cases the patient will have to go down hill, for a level surface will be slanting from him. The first class of patients will become accustomed to their glasses much sooner than the second class. A few days' annoyance will cover the period for the first class, but the annoyance for the others will continue for a week and sometimes much longer.

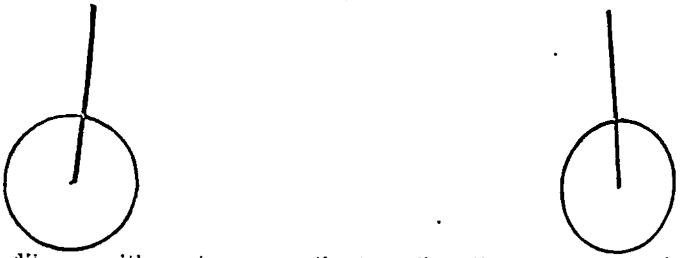
Dr. E. L. Jones, Cumberland, Md.: Vertigo caused by the eyes has impressed me as one of the commonest symptoms. I have had a number of little children, who had not reached the stage of headaches, complain of giddiness and if anything comes up that directs attention to the eyes it is corrected. I have seen old people in the sixties who had extreme giddiness which good physicians had tried to relieve. Apparently their eyes would be all right, they might have been wearing presbyopic lenses for a quarter of a century. The slightest error in refraction may produce it. We often find a low grade of astigmatism that does not blur the vision in the slightest. The axes have been inclined and the wearing of glasses has brought marvelous relief. I recall the case, ten or twelve years ago, of a stonecutter who had extreme dizziness and who was not dissipated or neurotic. He could work only a day or two at a time. His eyes were refracted under complete cycloplegia. He had 1 diopter spherical of hyperopia. It was corrected and after he became used to the glasses he had no further vertigo. The explanation of vertigo is varying. In one instance a man had been in bed about a week. He said he could not come to the office. When his eyes were tested he could sit up only about five minutes at a time. He had a small vertical astigmatism and in about three or four weeks had recovered from the vertigo. I have seen many cases of men disabled from their vocations on account of vertigo who had no ocular symptoms whatever, no distressing symptoms about the eyes, no particular reflexes at all, no headaches or what are considered the ordinary symptoms of eye-strain. I keep fairly accurate records of the cases I do under cycloplegia. In 1912 I found 168 cases of manifest reflex ocular symptoms, of whom 69 complained of vertigo of varying degrees. Of 40 men, 15 had vertigo; of 96 women, 42 had it; of 15 boys, 7 had it, and of 17 girls, 5 had it. I am not very reverential in the presence of the heterophorias but I take off my hat to astigmatism, especially if it has a tilted angle.

Dr. Lewis H. Taylor, Wilkes-Barre, Pa.: Dr. Bulson speaks of the fact that these patients are of the neurotic type. Perhaps the majority of them are neurotic because of the astigmatism. In the beginning they are not neurotic. I recall particularly one of the surprises of my early practice. A physician who was approaching a condition of melancholy, being on the verge of collapse, came to me and said he was worried and was unable to go on with his work. All that was done was to correct his astigmatism, which was of low degree. As I remember it, this man had selected very low cylinders, but the axes were 15 in each eye. The correction restored the man to health and he is hale and hearty, a man past 70, still in active practice. This occurred twenty years ago. Vertigo was a prominent symptom in the case of another physician who was in much the same condition, ready for a breakdown. The result of the correction was the same. These are only two cases of many that I can recall. It seems to me that in these cases of vertigo we should always proceed to correct the refractive error, and if we do not succeed in correcting the vertigo we will find other trouble, probably in the labyrinth.

Dr. C. D. Wescott, Chicago: These patients are not always neurotic. A mechanic, not engaged in fine work, was referred to me after passing careful examinations by an internist and an aurist. I found less than a diopter of astigmatism, with oblique axes, and he was immediately relieved by the use of his correction. A few months afterward I was disappointed to see him return with the original symptoms and thought possibly I had misjudged his case. Full cycloplegia showed that during the interval there had been a slight change in the axes of his astigmatism which I corrected and he was promptly relieved again.

Dr. F. Park Lewis, Buffalo, N. Y.: I think we have all had experience with the various ocular vertigos, but two or three years ago I brought to the attention of the profession, before the Academy of Medicine in Cleveland, conditions associated with this vertigo and the relation of vertigo with or without astigmatism, to aural conditions, such as tinnitus, etc. I found a paper by Rolleau in which he called attention to various conditions associated with eye-strain. After having presented my paper Dr. Risley discussed it and alluded to the fact that a variety of conditions were associated with eye-strain. The next year Dr. Theobald presented a paper before this section in which he quoted my findings and added still others. At least four of our colleagues took up the question of the relationship between the eyes and various aural conditions. That fact having been called to the attention of a colleague, he relieved a case of tinnitus by correcting the refraction. This condition is not widely enough known and I intend to collect the facts bearing on the direct relationship between the eye and the ear. Whether it is through Deiter's nucleus or otherwise, there is direct connection between binocular vision and aural conditions and I shall be glad to have a note from you as to your experience along this line.

Dr. Walter B. Lancaster, Boston: It is interesting to theorize as to the possible mode of operation by which oblique astigmatism may produce vertigo. We maintain our sense of equilibrium by afferent messages to the higher centers from many sources such as the semicircular canals, the visual apparatus, the muscle sense, the tactile sense, superficial and deep. All these messages are intimately correlated by an adequate system of connecting paths and presided over by centers of which we may mention the important one in the cerebellum. Like all important functions this has a wide margin of safety in normal individuals. I mean by this that there can be disturbances in various parts of this mechanism without throwing it out of gear so far as to cause vertigo. A disturbance anywhere in the mechanism of equilibrium may cause vertigo in a patient who has little margin of safety to spare, even though an equal disturbance in this mechanism in a more normal subject would not cause vertigo but only a slight disagreeable sensation. That is how I account for the fact that of the thousands who have oblique astigmatism only a few have vertigo of sufficient degree to seek medical advice. The patient must be susceptible. The nervous system, in that particular regard, must be sufficiently unstable to be deranged by so slight a cause, if indeed it be a slight cause that makes lines we had reason to think were vertical appear slanting and makes other objects occupy correspondingly abnormal and unnatural positions. It is well known that oblique cylinders and oblique astigmatism cause vertical lines to appear slanting. Savage has written much on this subject. The common explanation of how these slanting lines are fused and not seen double is that the eyes are rotated to correspond to the slant by the process called torsion or declination but this is an error. A stereoscopic toy slightly modified from the one of Perry, which he published in 1895 to show that the eyes do undergo torsion, I use to disprove it. By moving the handle up and down you can imitate the slanting of the vertical lines which would be produced by oblique cylinders. The lines are fused, not by torsion, but by virtue of what I call the function of *stereoscopic fusion for relief* or depth; Verhoeff calls it "psychical compensation." This makes the fused line appear to extend forward or backward from the surface of the paper, out into space, giving the sense of depth, relief, third dimension of space. It is not a function of the retina but of the visual centers of the brain and is no doubt closely associated, as



Viewed with a stereoscope the two tilted lines fuse as a single line leaning toward the observer as if projecting forward from the plane of the paper. Perry's device is simply an attachment for mechanically tilting the lines at any angle while observing them with the stereoscope.

Dr. Greenwood points out, by connecting paths with the other centers concerned in the perception of our relation to objects in space — the function of orientation and equilibrium.

Dr. George S. Derby, Boston: I should like to ask Dr. Greenwood whether he makes any distinction between vertigo and dizziness. I agree with Dr. Bulson that many of these cases are neurotic and I feel a great deal of doubt as to whether such small degrees of refractive error would cause dizziness, as in Cases 3 and 10. I take exception to Dr. Greenwood's statement in Case 10. He says: "The wearing of this slight correction of the astigmatism constantly has entirely stopped the vertigo." The lens was a plus 0.25 cyl. ax. 9 in both eyes. I think it is difficult to say that the wearing of that correction corrected the astigmatism and stopped the vertigo alone. I call attention to the fact that the prescribing of glasses is one of the most powerful suggestive methods of treatment.

Dr. Edward Jackson, Denver: A physician of 50 years, weighing 250 pounds, successful in his practice, well-to-do, and a man who is not in the ordinary sense neurotic, came to me for persistent vertigo, for which he had tried all sorts of things. He required 0.25 and 0.37 cylinders, which relieved him. In two or three months he thought he was well and left off the glasses. The vertigo returned. He put them on again and wore them for over two years. Then he found that he got along pretty well without them for several months, and the vertigo gradually returned. I remeasured the eyes and found about the same amount of astigmatism. He put on glasses and again obtained relief. I think that very low degrees of ametropia may cause perceptible and annoying vertigo.

Dr. Hiram Woods, Baltimore: There are two possible errors in diagnosis in low grades of astigmatism. Some years ago Dr. Theobald of Baltimore called attention to the fact that the normal near balance is exophoria of from 2 to 5 degrees, as compared with the distant balance. For instance, if there is orthophoria in distance we must look for a near balance of from 2 to 5 degrees of exophoria. There has been considerable discussion as to whether or not this is true, but I believe it is, and that such a relation should be sought. We get a class of cases in which the near balance is esophoric when compared with the distance balance. Theobald asserts that when this exists, after correction of refraction error, the meaning is ciliary asthenopia. The accommodative muscle demands excessive innervation; positive relative convergence is low; that is, there is a very low adduction, the patient being unable to separate his Ac. and Con. Hence, the excessive innervation goes to the internal recti as well as to the ciliary muscles, and an apparent near esophoria results. It is to be treated by convex glasses for near. If every vestige of static error is corrected there is, I think, no doubt of the truth of Theobald's contention, but one can easily fall into error with these low grades of astigmatism. The ametropia is slight and accommodation corrects it with normal vision, but this is done by excessive ciliary action. Hence, there is corresponding overaction of the interni and apparent near esophoria. One diagnostic error is failure to find the low astigmatism. The presence of normal vision misleads. The clue to the condition is variations from day to day in subjective tests under cycloplegia. In other words, the eye does not yield readily to cycloplegics. Then there is liable to be a reddened disk, significant of chorioidal irritation. When a young patient presents the symptoms outlined by Dr. Greenwood and has, before the use of a cycloplegic, a near relative esophoric balance, I think we ought to push the cycloplegic until several subjective examinations agree with each other and with objective measurements. In this way we relieve ciliary irritation. If we do not uncover these low grades of astigmatism, the patient cannot get well, and will soon present seeming need for plus glasses in the near. The other diagnostic pitfall is interpreting this near esophoric balance as real esophoria and treating it with prisms, bases out. The guide is assured cycloplegia. Just one illustrative case: A young woman was wearing + 1.37 spherical for near vision. Her distance balance was orthophoric, her near, esophoric without glasses, exophoric with them. Under scopolamin there was inconsistency between examinations for several days. Finally, it settled down to low hypermetropic astigmatism with axes at 30° and 150°. Under these, the apparent esophoria in the near disappeared, and the normal near exophoria took its place. In my judgment there is no class of refraction cases so apt to mislead one and so important to the patient.

Dr. Allen Greenwood, Boston: The case Dr. Derby mentions was the only astigmatic one in which the axes were not somewhat tipped and yet the patient was sent to me after having been through the hands of the family physician and an aurist for a dizziness which had been very distressing for two or three months. For a year and a half there has been no vertigo. It may be mental impression but the dizziness has disappeared. In other cases with equally slight astigmatism in which the axes were oblique, taking off the glasses has reproduced the dizziness, so I do not believe that in all slight cases this relief has been due to mental effect. I have used vertigo and dizziness as synonymous terms. I have seen many cases, during the past years, of slight vertigo along with other symptoms, particularly headache, and I have seen a great deal of car sickness which is somewhat akin to this condition, but all the cases in this respect have come to me for the relief of marked dizziness. I have not found that these patients were especially neurotic, although some of them were. One of my house officers was actually unconscious for a few minutes after a rotation test and this recalls the case of the girl who was thought to be epileptic but has had no attacks since wearing glasses. The physician I referred to was a man who weighed 200 pounds and was in splendid condition. He was ready to give up his practice for what he supposed was arteriosclerosis. For the last two or three years he has been comfortable and free from dizziness and able to carry on a large practice.

IS THE PERCENTAGE OF MYOPIC EYES DIMINISHING?

SAMUEL D. RISLEY, M.D.
PHILADELPHIA

In my report of the examinations of the eyes of the schoolchildren in Philadelphia, published in 1881, it was shown that the increasing percentage of myopia in the schools as the pupils advanced in age and school progress, as was set forth by the statistics of many observers both in Europe and America, was due not so much to the want of hygienic precautions in the schools as to the existing congenital defects in the eyes of the children. Many examples, it is true, were presented showing the baneful influence of inadequately lighted schoolrooms and other faulty environments over the eyes of all young children, but it was obvious from their collated statistics that the crux of the matter lay in the congenital visual defects. The findings of the Philadelphia examinations were set forth in elaborate statistical tables, and graphically displayed in a series of percentage curves, the latter of which are here reproduced for reference (Charts 1, 2, 3 and 4).

The entire work was summarized[1] in the following conclusion and recommendation:

That, *given an emmetropic or normal eye, the probabilities are that no harm will come to it from the educational process.* On the other hand, *given an eye with an anomaly of refraction, especially astigmatism, the probabilities are, other things being equal, that the educational process will be fraught with pain and danger to the eye.*

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[1] Tr. Med. Soc. of Pennsylvania, 1881.

Therefore, that before entering school the possible presence of defects of vision should be excluded, and any existing error of refraction corrected as soon as any trouble is experienced.

Briefly stated, it was shown by this investigation that the emmetropic eye, notwithstanding its relatively small percentage of the whole number, was to be regarded as the model or standard eye, since it passed through the stress and strain of school life with a minimum of pain and peril, and maintained a nearly uniform percentage through all the years of school life; that pain, lowered acuity of vision and disease steadily increased as age and school progress advanced in the eyes with defects of refraction, especially in astigmatic eyes; that with increasing school age the percentage of eyes with hypermetropic refraction steadily fell, while the percentage of eyes with myopic refraction increased in a corresponding ratio, the increasing refraction being associated with a steadily increasing percentage of pain, lowered acuity of vision and disease of the intra-ocular tunics. As a corollary growing out of these findings and conclusions it was recommended that no child should be permitted to enter on the educational process until the eyes had been examined.

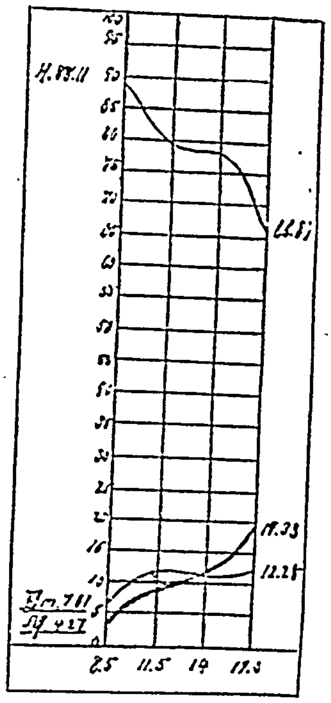

Chart 1

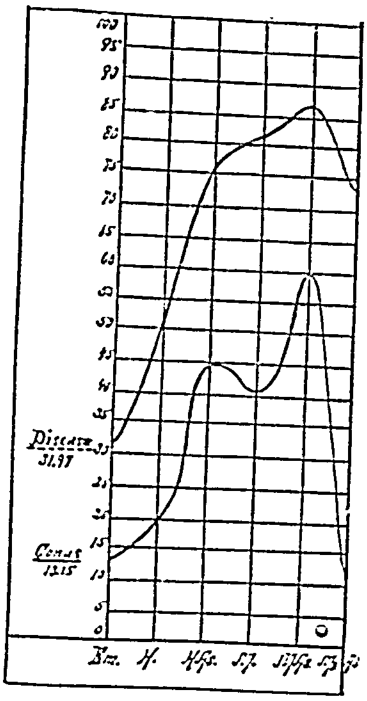

Chart 2

Chart 1.– Steady rise in the percentage of myopia as the school age advanced from 8½ to 17½ years and a corresponding fall in the percentage of hypermetropic eyes.

Chart 2.—Disease in relation to refraction.

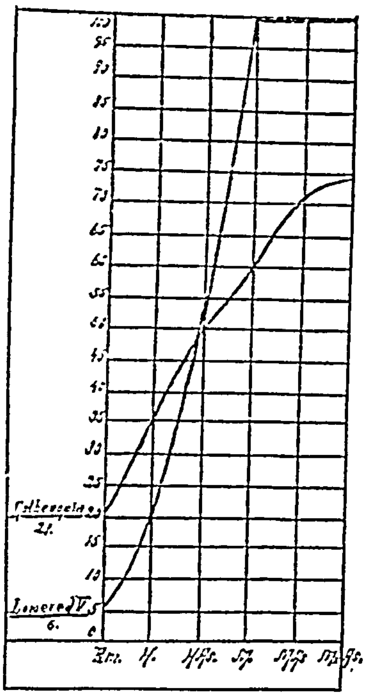

Chart 3

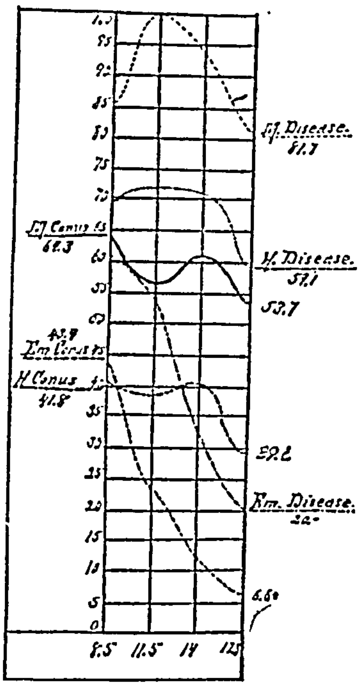

Chart 4

Chart 3.—Vision and pain in relation to refraction.

Chart 4.—Disease in relation to age.

While these statistics were in course of preparation I published;[2] and later presented before the American Ophthalmological Society, the history of a large series of cases,[3] all taken from my private case-books, in which the eyes had passed while under observation from hypermetropic to myopic refraction through the *turnstile of astigmatism.* These cases were presented and published to fortify the claims made in the report of the school examinations.

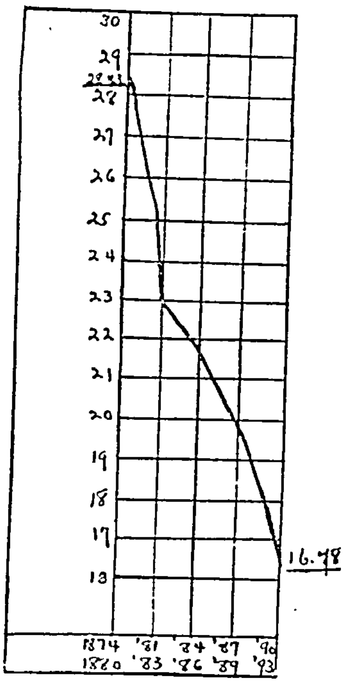

Chart 5

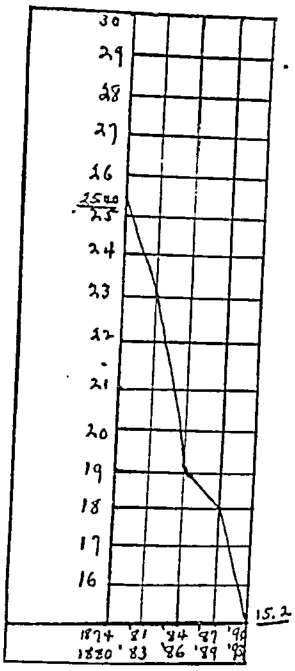

Chart 6

Chart 5.—Curve showing the steady fall in the percentage and degree of myopia from 1874 to 1893, inclusive, constructed from Table 1. From private case books.

Chart 6.—Curve showing the steady fall in the percentage and degree of myopia from 1874 to 1893, inclusive, constructed from Table 1. From opticians' books.

Twelve years later, probably because of this work, I was requested by the late Dr. William F. Norris to write the article on "School Hygiene" which appeared in 1894 in the second volume of Norris and Oliver's "A System of Diseases of the Eye." While preparing this article it occurred to me that if the conclusions based on the school report and published in 1881 were true, some demonstration of their truth should be shown after twenty years in a careful analysis of all cases applying in the routine of professional work for relief from asthenopia by the careful correction of existing congenital errors of refraction. In Philadelphia during the period from 1874 to 1893, inclusive, ophthalmic surgeons had habitually ordered glasses for the relief of asthenopia. During this period many cases of rebellious headache and nerve storms, after Dr. S. Weir Mitchell's famous paper on their relation to eye-strain, were referred to the ophthalmic surgeon for consultation and treatment. It was therefore logical, reasoning *a priori,* to assume, if the conclusions of the school report based on the statistics there formulated were true, that such an analysis of the cases as was proposed should show diminishing percentage in the relative number of myopic eyes and a lower degree of myopia. The work was undertaken, and the resulting figures were based on the refraction as shown by the glasses ordered for distance and constant wear. The work covered the correcting-glasses for a total of 195,754 eyes, of which 8,736 were from my private case-books, all of the latter having been painstaking corrections under the use of mydriatics, pressed to the thorough paralysis of the accommodation.

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[2] Risley, Samuel D.: Am. Jour. Med. Sc., October, 1880, p. 442.

[3] Risley, Samuel D.: Tr. Am. Ophth. Soc., 1884, 1887.

The percentage charts and the tables on which they are based are here reproduced for comparison with those to be presented in the present study:

This paper is a continuation of the study from 1894 to 1912, inclusive. The analysis is made only from my private case-books and mydriatic corrections, the mydriatic being pressed to complete cycloplegia, and a painstaking correction of the astigmatism and careful study of the binocular balance. The total number of eyes falling under the strict requirements of the analysis is 6,850.

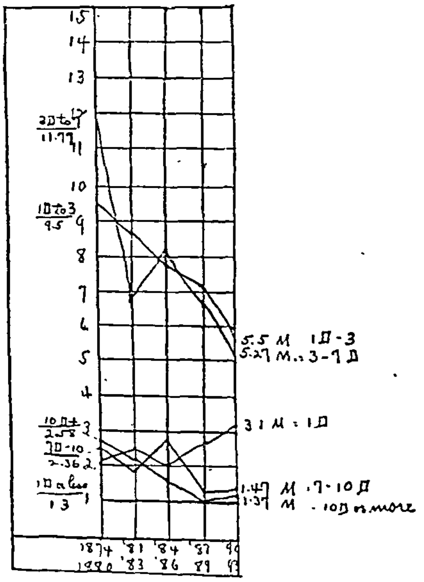

Chart 7. Curves showing the steady fall in the percentage and degree of myopia from 1874 to 1893, inclusive, constructed from Table 1. From private case books.

At the present time it has been found possible to complete the analysis only for the group of cases in the first three years, 1894 to 1896, inclusive, and for the group in the last three years, 1910, 1911 and 1912, giving for these years a total of 2,297 eyes. In all of these, painstaking effort was made by every means at our command to determine the static refraction of each eye, the determination being made after the more or less prolonged use of the stronger mydriatics. Homatropin was used only for elderly persons, and then for its therapeutic effects over irritable and inflamed eyes.

Many features of great interest and importance have been omitted from the report. For example, had the design been to show the significant and important anatomic relationship between anomalies of refraction and the abnormalities of binocular balance as etiologic factors in asthenopia and intra-ocular disease, a vast fund of information could have been set forth, but would have required the presentation of a large number of case histories by way of illustration and demonstration. Had this fallen within the scope of the paper, a large group of patients in which hypermetropic eyes had passed into myopic refraction *through the turnstile of astigmatism* would have been presented. They would not have been new cases, however, that is, patients coming for the first time for advice, but old patients who for some reason had neglected the correcting-glasses originally given, or as the result of ill-health, uveal disease, etc., had suffered an increase of refraction in their eyes.

TABLE 1.—PERCENTAGE OF MYOPIC EYES, 1874-1893

Years	Number of Eyes	Number of Myopic Eyes	Percentage of Myopia	Percentage of Simple M.	Percentage of Myopic Astigmatism	M. = more than 10 D.	M. = 7 to 10 D.	M. = 3 to 7 D.	M. = 1 to 3 D.	M. = 1 D or less
1874-1881	1,956	559	28.43	15.5	85.5	2.58	2.36	11.77	9.5	2.3
1881-1883	1,354	308	23.05	15.45	84.55	2.10	1.96	6.92	8.6	2.3
1883-1886	1,376	313	22.07	5.75	94.25	1.67	2.90	8.43	7.8	1.9
1886-1889	2.154	427	19.82	6.50	93.50	1.10	1.20	6.79	7.5	2.7
1889-1893	1,896	318	16.78	5.66	94.34	1.37	1.47	5.27	5.5	3.1
Totals and averages	8,736	1,925	22.03	9.67	90.33	1.76	1.98	7.84	7.78	2.46

In Table 3 the plan has been made to conform as closely as possible to that presented in the paper on "School Hygiene" in 1894 (Table 1). By reference to these tables and the accompanying percentage charts it will be seen that the percentage of myopic eyes beginning at 28.43 per cent. in 1874 rapidly fell through the intervening years to 16.78 per cent. in 1893, the average percentage for twenty years being 22.03.

TABLE 2.—PERCENTAGE OF MYOPIC EYES, 1894-1896 AND 1910-1912

Years	Number of Eyes	Number of Myopic Eyes	Percentage of Myopia	M. = More than 10 D.	M. = 7 to 10 D.	M. = 3 to 7 D.	M. = 1 to 3 D.	M. = 1 D. or less
1894	498	75	15.06	5.33	10.66	26.66	26.66	29.2
1895	440	57	13.40	7.02	7.02	17.54	21.05	40.35
1896	483	66	13.86	13.48	3.03	22.73	37.88	22.73
Totals and averages	1,421	198	14.07	8.61	6.90	22.31	28.53	30.76
1910	275	37	13.45	.....	5.41	45.95	18.91	29.73
1911	292	24	8.21	.....	.....	12.50	41.67	45.83
1912	309	37	11.97	5.41	2.70	21.62	37.84	32.43
Totals and averages	876	98	11.21	1.80	2.70	26.69	32.80	35.99

In the tables now presented (Tables 2 and 3) it will be seen that the percentage of myopic eyes for 1904 had fallen to 15.06 per cent., for 1905 to 13.4, and for 1906 to 13.86, giving an average for the three years of 14.07 per cent., as compared to 16.78 for the preceding three years, or 22.03 per cent., the average for the preceding twenty years. The diminishing percentage of myopia is made strikingly manifest by the figures shown in the last three years, 1910 to 1912, inclusive. In 1910 there was 13.45 per cent. of myopic eyes, which fell in 1911 to 8.21 per cent., but rose in 1912 to 11.97 per cent., or an average for the three years of 11.21 per cent. The result for the entire period from 1874 to 1912 is graphically set forth in Chart 9, in which the average percentage of myopia for each succeeding period of three years is shown by the steadily falling curve from 28.43 per cent. in 1874 to 11.21 per cent. in 1912.

In Table 3 (not included in the presessional volume), the percentage of the degrees of myopia from 1 D. or less to 10 D. or greater are here calculated on the total number of eyes, as in Table 1 from "School Hygiene," whereas in Table 2 these percentages were calculated on the total number of myopic eyes.

TABLE 3.—SHOWING DIMINISHING PERCENTAGE OF MYOPIC EYES AND A FALL IN THE DEGREE OF THE MYOPIA

Years.	No. of Eyes	No. of Myopic Eyes	Percentage of Myopia	M.=10 D. or more	M.=7 to 10 D.	M.=3 to 7 D.	M.=1 to 3 D.	M.=less than 1 D.
1894	498	75	15.00	.80	1.00	4.12	4.12	4.12
1895	440	57	13.40	.91	.91	2.27	2.73	5.23
1896	483	66	13.86	1.86	.41	3.10	5.18	3.10
Totals and averages ..	1,421	198	14.07	1.19	.97	3.16	4.01	4.25
1910	278	37	13.45	....	.73	6.18	2.54	4.00
1911	292	24	8.21	....	.....	1.3	3.42	3.73
1912	309	37	11.97	.61	.32	2.59	4.56	3.88
Totals and averages ...	876	98	11.21	.20+	.35	3.36	3.51	3.87

It will be observed in Table 3 that the percentage of high myopia, 10 D. or greater, during the first period of three years, shows a steady rise in the number of such eyes from 0.80 per cent. in 1894 to 0.91 per cent. in 1895, and to 1.86 per cent. in 1896. In 1910 and 1911 not a single case of M.=10 D. was seen, reducing the average for the three years to 0.20 per cent., as compared to 1.19 per cent. for the first period. The interesting fact is set forth in Table 2 that while the percentage of the higher grades of myopia falls with more or less regularity with the succeeding years, the lower grades less than 3 D. steadily advance, not in actual numbers but in relation to the whole number of myopic eyes.

A study to ascertain if the same results would be shown by the annual reports of the staff at the Wills Hospital was disappointing. These reports, indeed, showed a slight rise in the percentage of myopia. It should be stated, however, that a constantly increasing percentage of the patients are foreign born, emigrants from southern Italy, Poland, Hungary and the Balkan States, and Russian Jews. Many of them, especially the latter, suffer from high grades of myopia and serious intra-ocular disease. They come from sweat-shops and other allied forms of employment, working with insufficient light in badly ventilated rooms, and living on insufficient and improper food. under outrageous hygienic environment. In private practice these cases are rarely seen; but even among these hospital patients the average myopia for the same period included in this report was only 15.43 per cent. The percentage of high myopia in my private records as shown in Table 2 is based on the total number of cases of myopia of 10 D. or more of only nineteen in a total of 2,297 eyes, or 0.87 per cent.

The statistics, therefore, gleaned from my private case-books show unmistakably that in my personal experience there has been a steady fall in the percentage of myopic eyes applying for treatment. This demonstrates the truth of the claim set forth in the conclusions of my report of the Philadelphia school examinations, published in April, 1881, as to the baneful influence of uncorrected errors of refraction. Furthermore, the ophthalmic surgeon has the satisfaction of seeing that his efforts in the correction of these congenital defects of refraction and faulty binocular balance have well-nigh banished from the better-to-do portion of the community the nightmare of malignant myopia and its sequelae.

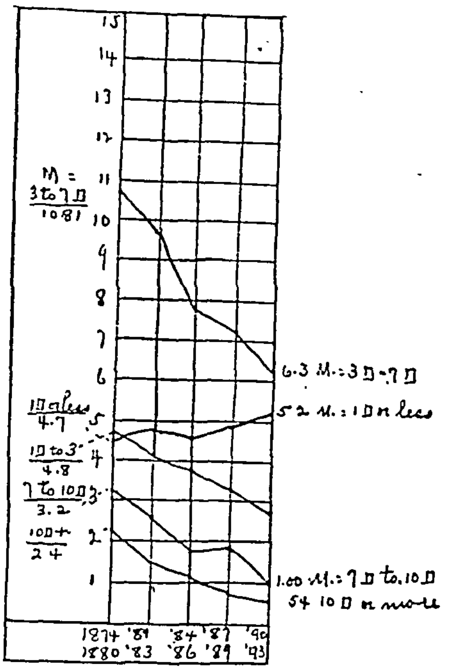

Chart 8.—Curves showing the steady fall in the percentage and degree of myopia from 1874 to 1893, inclusive, constructed from Table 1. From opticians' books.

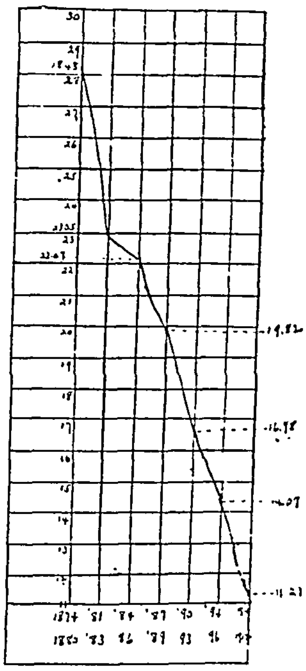

Chart 9.—Combined chart showing decrease in myopia.

2018 Chestnut Street.

ABSTRACT OF DISCUSSION

Dr. F. Park Lewis, Buffalo, N. Y.: I do not believe that the profession has begun to realize the enormous service done by Dr. Risley in his careful investigation of refractive cases under cycloplegia, begun more than twenty-five years ago. There have been many examinations of the eyes of schoolchildren before and since that time, but most of them have been under such varied conditions and with so little attention to detail that they are almost valueless for statistical purposes or for methods of comparison. Since this paper was referred to me for discussion I have again gone over the literature thoroughly and I find that the subject has been considered from two standpoints, that of the ophthalmologist and that of the teacher. To obtain a series of records made from the investigations of a careful ophthalmologist, with the accommodation of the subject placed at rest, means great labor, both in the determination of facts and in the arrangement of those facts so that they may be of subsequent use. In studying a subject for statistical purposes, let it be what it may, it is essential that the special point expected to be brought out must be particularly emphasized when the investigations are made, otherwise it is merely incidental and of comparatively little value. The purpose of this investigation, as brought out in Dr. Risley's paper, is to determine whether or not myopia is increasing. Before that question can be answered we should arrive at an understanding as to the meaning of myopia. Most ophthalmologists now recognize two definitely distinctive conditions. First, the congenital one, in which the anterior posterior axis of the eyeball is abnormally long, just as the hyperopic eye is abnormally short. taking the emmetropic eye as a standard. Those varying in length from the normal are deformed, but they are not diseased, nor are they, because of deformity, necessarily more subject to disease. On the other hand, there is an ectasia, which is definitely pathologic, in which the anterior posterior diameter lengthens with increasing rapidity, during the years of adolescence, usually ceasing to progress after the tissues of the body have become physiologically developed. I believe that these two conditions should be differentiated by distinctive names. The congenital myopic eye might continue to be so called, but the ectasia produced during the developing years should be known by some name indicating the pathology involved, such as posterior ectasia of the globe. We then would have a scientific basis which would enable us to separate the pathologic from the merely deformed eye. In the latter, so long ago as 1897, Dr. Risley said: "If heredity has any important place in the history of near-sighted eyes it lies in the production of these anatomic differences." He was of the opinion that congenital anomalies in the form of the eyeball are hereditary rather than myopia or any tendency to myopia. Dr. Risley attributed the myopic tendency to certain distortions in the form of the skull which affect the shape of the orbits. At this time the inheritance of ocular abnormalities had not been accepted. Cohn considered that the fact had not been substantiated, but the intensive study by Steiger of the eyes of 36,654 Zurich children has established Dr. Risley's contention of the inheritance of astigmatism and the relationship of astigmatism in the development of myopia, while the studies and measurements of Stilling have substantiated Dr. Risley's second contention that the form of the eyeball is largely determined by the shape of the human skull. The determination of the question as to whether or not myopia is increasing is then of more than academic interest, because if it is proved, as it seems to have been, that by abolishing astigmatism through the early adaptation of suitable correction glasses we do away with the tendency, in a large measure, to the production of myopia, we have established an etiologic fact of enormous clinical importance. This view has not yet been fully accepted. The most complete study of inheritance of defects of vision probably ever made is that by Amy Barrington and Karl Pierson which is published in the "Eugenics Laboratory Memoirs," London, 1907. In this Steiger's studies are most carefully analyzed, and among many other valuable conclusions, or rather deductions, Steiger says: "Astigmatism with the rule is always congenital; that it is never found to occur after birth, and no statistics demonstrate a more intense astigmatism according to the rule; in later years a reduction, sometimes very marked, may occur in its value." The deductions which Barrington and Pierson draw, from their studies, are that: "No sufficient or definite evidence that school environment has a deleterious effect on the eyesight of children has yet been definitely demonstrated. Undoubtedly considerable change of vision takes place during school years, marked first by a decrease in the hypermetropic classes, and an increase in the emmetropic classes. This is followed, between the ages of 10 and 14, by a decrease in the emmetropic and an increase in the hypermetropic, astigmatic and myopic classes, the balance being still in favor of emmetropia when school is left." Is the first a growth law and the second an environment natural effect? Or are both but phases of one law of growth, a passage from hypermetropia to myopia of the "unstable stocks"? This has led Professor Burnham of Clark University, in the "Encyclopedia of Education," under the heading "Myopia," to the conclusion that a certain number of children will inevitably become myopic, and, while recognizing the desirability of good school surroundings, he believes that the condition is an essentially developmental one which we are unable to modify. This brings vividly to the front Dr. Risley's contention, in which he and the rest of us, I think, are in agreement, that astigmatism is inherited; that it is on uncorrected astigmatism that myopia depends, but, and this is the essential point, that we inherit tendencies and that if astigmatism is abolished by right correcting glasses, we would thereby lessen the likelihood of the development of myopia. If this is true, and the most careful records seem to prove that it is, we have a fundamental principle of vital importance on which to proceed: The imperative necessity of the early correction of astigmatism and other forms of eye strain at that period in life when the tissues are plastic and in which they are assuming their ultimate form.

Dr. Albert E. Bulson, Jr., Fort Wayne, Ind.: Careful correction of errors of refraction in patients of all ages has done much toward the reduction of myopia, but we must also take into consideration the great advancement made in the construction of buildings, including improvements in lighting, ventilation, etc. We have also adopted the system of school examinations and otherwise put in practice many things that tend to raise the resisting power of the child, not only his general condition, but the eyes as well. Dr. Risley is so scrupulously accurate about everything that I hesitate to criticize him and yet I wish to call attention to his use of the word "mydriatic" in the place of "cycloplegic." Every cycloplegic is a mydriatic, but not every mydriatic is a cycloplegic. Euphthalmin is a mydriatic, but not a cycloplegic. When we wish to speak of paralyzing the accommodation, we ought to use the term "cycloplegia," and the agent used should be called a "cycloplegic."

Dr. S. D. Risley, Philadelphia: If the apparent teaching of the statistics of my own work is true also for that of ophthalmologists in all parts of the United States, then the ophthalmologist has accomplished more for the conservation of vision by the correction of defects of refraction and anomalies of binocular balance than all else that has been done. When we consider the handicap for any career which the man with high myopia has; when we further consider the large numbers of people with central chorioidal atrophy, floating vitreous opacities and other sequelae of high myopia, we can hardly overestimate its value.

Necessity for Local Meat Inspection.—The monthly *Bulletin of the Indiana State Board of Health* for April prints a letter from one of the food inspectors of the State Board, who is a veterinarian. This report forcibly calls attention to the need of the inspection of meats killed outside of the large packing houses where Government inspection is provided. In the instance to which attention was called by the inspector, a cow, which had been condemned when a certain dairy was inspected, was found in a local slaughtering establishment. The animal had been milked up until the time of slaughter. The inspector found the abdominal cavity filled with miliary tubercles and also a tubercular condition of the lungs. On the protest of the inspector the meat of the animal was tanked.

POSTCATARACT EXTRACTION DELIRIUM

REPORT OF ELEVEN CASES

WALTER R. PARKER, M.D.
DETROIT

The first description of postoperative psychoses dates back to the sixteenth century when Para called attention to the occurrence of mental symptoms after operations. In 1819 Depuytren described a "delirium nervosum" which occurred in the first three days after an operation, and in 1842 psychoses after eye operations were reported by Sherzog. Sichel[1] in 1863 described a peculiar delirium which he had observed seven or eight times in the wake of cataract operations. All the patients were over 60 years old. He attributed it to sealing the lids and thought the mental effect similar to homesickness. Arlt[2] wrote in 1874:

> The second eye is uncovered before the fourth day only when the patient becomes restless because of darkness. In old patients, much run down, timid and nervous, mental disturbances may occur during the first few days after the operation.

I have been unable to find a classification from the tandpoint of the psychiatrist. Evidently no single form of mental disturbance is characteristic of postoperative delirium. Hurd[3] would limit the cases to those clearly the result of infective processes, while Selberg,[4] in addition to infection, includes anesthesia, drugs, auto-intoxication, physical or mental exhaustion. Picque[5] eliminates cases due to alcohol, drug intoxication and septic infections. He employs the term only to designate those instances in which the trouble supervenes in a patient not otherwise ailing. Burr[6] says that transitory confusion or delirium rarely occurs in the aged without the presence of severe arteriosclerosis and marked disease of the kidneys, even when the immediate cause is auto-intoxication from the intestines or stomach, or from some unknown endogenous source. He does not think the cerebral arterial disease is the cause of the attack, however, as practically all the aged have hardened arteries and may show no mental illness. These transitory attacks are not due to the fact that the thickened arteries do not carry enough blood to supply the brain, but are caused by a poison or poisons carried by the blood. Phillips[7] holds that in old age trivial causes may produce a wandering of the mind, due no doubt to the impaired nutrition of the nerve-cells from a diseased heart or sclerosed cerebral vessels. Gressinger, as quoted by Löwy,[8] advocates the theory that the causative factor for the origin of the psychoses lies in peripheral nerve injury or a disease of the sensory nerves originating peripherally from operative traumatism. Schultze[9] concludes that postoperative psychoses occur after all forms of operation but most frequently after "predisposed diseases." In a large number of cases a hereditary tendency is found. He agrees with Picque that definite cases of real postoperative psychoses, in contrast to the false postoperative delirium, are reduced to a small number. In the great majority of cases fever, lasting toxic condition after the operation, inanition and condition of weakness, the cause of which is to be sought in the underlying disease itself, offer the explanation for the oncoming condition of psychosis. Engelhardt[10] concludes (1) that postoperative psychoses develop in individuals predisposed by heredity, chronic intoxication, grief or care; (2) that the weakness incident to the operation or disease preceding can scarcely be considered essential—at most it may be considered as the determining factor in predisposed cases, and (3) that there are cases of postoperative psychoses in which an etiologic understanding is not as yet accessible.

It has been contended that serious operations on the pelvis and genital organs and operations on cataracts were especially prone to be followed by mental disorders. While most of the cases of postoperative delirium have been reported by ophthalmologists and gynecologists, it is generally agreed that the character of the operation itself has little or no influence in inducing a postoperative psychosis. The hereditary predisposition of the patient, his habits as to alcohol and drugs, his physical, mental and moral qualities, his attitude assumed on entering the operating-room, effect of anesthetics, dressings and complications of the operation, such as infections, all have received consideration. The effect of the darkness of the room is important, as the delirium has been observed after the application of a bandage when no operation has been performed. Schmidt-Rimpler reports two cases of delirium following confinement in the dark room without operation, one, a case of syphilitic iritis, the other case of double iridochorioiditis, in a strong young man. From these two cases, he refers the controlling visual hallucination to the shutting off of the sight sense. In cases which do not show hereditary predisposition, complications of a septic or toxic nature, disturbance of kidney or liver functions, and in which history of alcoholism and hysteria can be eliminated, the operation itself and the subsequent treatment must be reckoned as etiologic factors. Krafft-Ebing long ago suggested the possibility of fright incident to the eyes being bandaged as the exciting cause of the delirium. That the "dark cure," however, is not responsible for all cases is proved by the fact that many patients show mental disturbance when the eyes are not bandaged. Urbach,[11] for instance, reports five cases of delirium occurring in 106 operations for gall-stones. Kelly,[12] Baldy[13] and others have reported gynecologic operations which were followed by mental disturbance and in none of them were the eyes bandaged.

From this incomplete list of published cases of postoperative delirium it will be seen that the writers are not agreed as to its etiology or classification. The prognosis is generally good. But here, again, much depends on the class of cases included in the report. The age of the patient is thought to be a most important factor. A few cases have been reported in patients below the age of 60. The late onset and long duration of the mental disturbance are noticeable in these younger patients, and the prospect of recovery is not so favorable as in the old.

The cases here reported are from the ophthalmic clinic of the University of Michigan from 1908 to 1912, inclusive. The report includes cataracts of all kinds, occurring in the old and young. There are eleven cases of delirium in a total of 376 cataract extractions as shown in the accompanying table:

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1. Sichel: Ann. d'ocul., 1863, xlix.
2. Arlt: Handbuch der gesamten Augenheilkunde (Graefe-Saemisch), 1874, iii, 309.
3. Hurd: Am. Jour. Obst., 1899, xxxix.
4. Selberg: Beitr. z. klin. Chir., 1904, xliv, 173.
5. Picque: Bull. et mém. Soc. de Chir., Paris, 1898, xxiv, 171.
6. Burr: Transitory Mental Confusion and Delirium in Old Age, The Journal A. M. A., Dec. 30, 1911, p. 2118.
7. Phillips: Cleveland Med. Jour., 1909, viii, 531.
8. Löwy, Rudolph: Allg. Ztschr. f. Psychiat., 1896, lii, 166.
9. Schultze: Deutsch. Ztschr. f. Chir., 1910, civ, 584.
10. Engelhardt: Deutsch. Ztschr. f. Chir., 1910, lviii, 46.
11. Urbach: Wien. klin. Wchnschr., 1907, xlvii, 1465.
12. Kelly: Surg., Gynec. and Obst., 1909, ix, 515.
13. Baldy: Am. Jour. Obst., 1891, xxiv, 1217.

DELIRIUM FOLLOWING CATARACT EXTRACTION

	Patients Operated on				Patients Delirious			
	No.	Av. Age (Yrs.).	Youngest.	Oldest.	No.	Av. Age (Yrs.).	Youngest.	Oldest.
Males	253	62.35	2.5	90	7	74.28	69	80
Females ..	143	61.05	25	86	4	68	53	82
Total...	376	61.07			11	65.71		

Following is a brief history of my cases of post-cataract extraction delirium:

CASE 1.—B. M. G., woman, aged 75. Urine examination negative. April 20, 1908, simple extraction. No accident. During the evening of the second day almost maniacal, becoming uncontrollable, up and down during the night; disoriented, auditory hallucinations; tore dressings from eyes several times; wound opened, no prolapse of iris. Left hospital with daughter on third day against advice. Anterior chamber filled with blood. Returned one month later for secondary cataract operation. Eye in perfect condition. No mental disturbance after reaching home.

CASE 2.—G. W. M., man, aged 71. Urine examination negative. Oct. 22, 1908, combined extraction; no accident. Two days later delirium developed; disoriented, out of bed, fell on floor, arose and walked about the ward, calling for wife and daughter, believing himself at home. Patient put back in bed, dressings removed from unoperated eye, given ice-cap and the situation explained. He soon quieted down. No recurrence. Operation surgically perfect.

CASE 3.—G. P., man, aged 81. Urine examination not recorded. Bothered with old cystitis, passing urine involuntarily. March 1, 1909, combined extraction. Patient very restless on operating-table. Second night delirious. Bandage removed from unoperated eye. Next day patient quiet. No subsequent attacks. Eye not damaged.

CASE 4.—M. C., woman, aged 82. Urine examination negative. April 29, 1909, combined extraction. No accident. First night patient nervous and restless, sat up on edge of bed; unoperated eye uncovered. Controlled with difficulty until the third day when she became disoriented with hallucinations. Continued to have periods of disorientation until discharge on twelfth day. Eye not injured.

CASE 5.—M. T., woman, aged 62. Blood and urine negative. Dec. 12, 1909, combined extraction. Next day patient became delirious, fairly well oriented but suspicious of those about her, garrulous, and not amenable to discipline. This continued until patient was discharged on the twelfth day. Operation surgically perfect. No further record.

CASE 6.—B. S., man, aged 77. Urine negative, Aug. 15, 1910, combined extraction, given codein 1 grain. During evening of second day patient out of bed, talked incoherently, disoriented; given morphin sulphate ⅛ grain hypodermically, with little effect. Patient restless all night, out of bed several times. Following day thought he was in a barn, but did not know doctor or nurse, refused to go back to bed. Anterior chamber filled with blood. Given morphin ¼ grain. Slept during part of the day. Fifth day increased restlessness all afternoon. He knew he was in a hospital but thought his son was in a near-by bed, and had been subjected to an operation. This condition continued until the tenth day when he became oriented and quiet. Result of operation perfect.

CASE 7.—F. K., man, aged 80. Urine normal. May 1, 1911, combined extraction. On following day became delirious. Out of bed twice, tore pads from both eyes. Played with loops and picked at bed-clothes. Given veronal without effect. Up and walking about during the night. Could not be induced to go to bed; highly excited, talked incoherently. Violently resisted any attempt to put him back to bed. Tried to escape from room by pushing doctor and nurse aside. Repeatedly tore pads from eyes. Given scopolamin 1/1000 grain. After half hour slept for six hours. Constantly confused and disoriented until discharged on eighteenth day. Eye not injured. No subsequent record obtained.

CASE 8.—M. C., man, aged 70. Urine examination negative. Oct. 15, 1911, combined extraction. At midnight of second day after operation he became confused, tore bandages from his eyes and wandered about the room. Was quieted by intern, became oriented, gave as excuse he had wakened suddenly and could not locate himself. Thereafter convalescence was uninterrupted. Eye not injured.

CASE 9.—M. S., female, aged 53. No record of urine examination. Jan. 25, 1912, combined extraction. No accident; given codein 1 grain. Considerable reaction followed the operation. Patient was nervous and apprehensive but suffered no delirium until sixth day when she became disoriented and talked irrationally. Refused to eat, claiming food contained cut glass. Several times attempted to get out of the room and to go to see the doctor. Thought she heard some one calling her name. On the ninth day more quiet, but constantly watchful, frequently asserting she might be harmed. Never again disoriented. Always knew the names of those about her. Auditory hallucinations continued until the time of discharge on the twenty-first day.

CASE 10.—M. E., man, aged 72. Urine examination negative. July 17, 1912, combined extraction without accident. During night of second day after operation patient became delirious; nurse unable to control him. Out of bed, disoriented, had hallucinations of hearing and talked in a rambling manner. Pad was removed from unopened eye. Later he became nauseated and vomited a small amount of undigested food. No signs of delirium followed. Eye not injured.

CASE 11.—M. S., man, aged 69. Urine negative. July 12, 1912, combined extraction. During afternoon of second day became delirious. During night much worse, with hallucinations of hearing and disorientation. Given morphin sulphate ¼ grain and tepid sponge bath; removed pad from unoperated eye. Later given 1/1000 grain scopolamin, after which he slept three hours. On waking the delirium was still marked. Next day he was quiet and had no return of delirium. Eye not injured.

It will be noted, in the cases here reported, that the psychoses occurred only in the aged, the youngest male affected being 69 years old, the oldest 80, average 74.28; the youngest female 53, the oldest 82, average 68 years of age. Males were more frequently affected than females, seven patients being men and four women.

The psychoses began from twenty-four hours to six days after the bandages were applied. In five cases the delirium occurred during the daytime, in six during the night, but in every case the symptoms were more prominent at night.

In no case did the patient show signs of deviation from a normal mental state, either before or at the time of operation. A general anesthetic was not administered. Four instillations of 4 per cent. solution of cocain were used at intervals of two minutes in each case. After operation the patients were quiet and tractable. Later they became restless, indifferent to precautions to remain quiet, often raised themselves without assistance, disturbed the bandages, etc. They usually answered questions rationally, but gave little heed to instructions. With some patients the first manifestations become more marked at night; they get out of bed, perhaps allowed themselves to be quieted for a short time, or became obstinate, scolded and defended themselves. The majority were disoriented and hallucinations of hearing were more common that those of sight.

One of the most remarkable things about the series of cases here reported is that in not a single instance was the eye permanently damaged by the conduct of the patient during the delirium. Seven of the eleven cases became rational, and were apparently well before leaving the hospital. One left on the third day still unbalanced, but returned in one month, with a history of having had no mental disturbance after reaching home. Three were still delirious when they left the hospital, one on the twelfth, one on the eighteenth and one on the twenty-first day. No subsequent history was obtained in any one of these cases. Fever was not present in any case.

As a careful history of hereditary psychosis was not included in my notes and but two of the cases were studied by a psychiatrist, the mental disturbances cannot be classified. The following observations, however, may be made:

1. The delirium occurred in 0.29 per cent. of the cases operated.

2. No patient showed marked signs of mental disturbance while under observation, either before or at the time of operation.

3. One case showed possibility of infection from an old cystitis.

4. The urine was free from sugar, albumin or casts in nine cases. No record was made in two cases.

5. Codein was administered in two cases, 1 grain hypodermically, immediately after the operation.

6. The possible effects of cocain can be eliminated, as the mental disturbances did not occur in a single case until at least twenty-four hours after the time of operation, and there was no rise in temperature.

32 Adams Avenue West.

ABSTRACT OF DISCUSSION

Dr. Edward Jackson, Denver: I recall one case in which postoperative delirium was followed by a serious result. A patient at Wills Hospital some years ago, in his delirium got out of a second-story window, fell and broke his femur. I have never seen a serious result to the eye. Possibly, without showing evidence of it, the patient has the eye very much in mind and so avoids doing things that would involve it. It is quite possible that consciousness of something important done to the eye is an element in the delirium. Several years ago I saw mydriatic delirium in an elderly patient. It is possible for mydriatic delirium to arise from moderate doses of atropin, if continued through several days. It is well recognized that the wearing of a belladonna plaster may, after many days, produce delirium. We commonly think of such delirium as occurring in children but I have seen it several times in elderly people. In these cases of Dr. Parker's it can be ruled out as can other forms of poisoning or the results of septic conditions. We have, therefore, the pure postoperative delirium. Perhaps it is more noted in connection with cataract operations because there is less general disturbance of the patient. I am inclined to think that it is due largely to the element which Dr. Parker brings out in his statistics on the age of the patient: that it is a disturbance induced in a person who is undergoing senile changes affecting the mental processes. The disturbances of the patient do not seem serious to us and yet they are more so than we are inclined to estimate. These patients undergo a complete change of life and routine at a time when they are not mentally able to withstand the effect of the shock under circumstances of severe excitement. I think that the bandaging of the good eye, when it retains some sight, and perhaps the darkness of the room and the quiet, producing a different set of impressions through the sensory channels that still remain open, constitute another causative element. It seems to me it is distinctly a psychosis brought about by mental influences, best guarded against by reducing the changes from the normal life of the individual to the minimum.

Dr. Allen Greenwood, Boston: This condition might be called a form of mental shock, and as Dr. Jackson has suggested, will occur almost invariably among hospital patients. I have had two severe cases in the hospital. The first was a woman, aged 77, who at the time of her death was still insane. She never recovered her mental equilibrium after the postoperative delirium. The other patient was delirious for about forty-eight hours. The point in Dr. Parker's paper that is of particular value at this time is the necessity of accustoming the patients in some way to their hospital surroundings, and since seeing one patient permanently insane I have been trying to follow out this plan. In my private practice, if the patient lives near me, I am in the habit of operating in the home. With reference to this particular point I believe that I get better results, with good aseptic precautions and a trained nurse and with the patients in their home surroundings, among friends, than I can get in the hospitals.

Dr. C. D. Wescott, Chicago: I have had one fatality following the delirium Dr. Parker has described. There was nothing unusual about the operation. The delirium began within forty-eight hours after a perfectly smooth extraction in a patient aged 78, with marked arteriosclerosis. The bandages were removed and the wound opened, but we succeeded in controlling him with sedatives and the constant attendance of nurses. The wound closed and on the tenth day he seemed to be perfectly well and was happy at the prospect of going home. That day the special nurse was taken off his case. The night nurse saw him at 12 o'clock and all was well. At 12:15 she heard a crash. The patient had gotten out of bed, run out of the room and jumped over the rail surrounding the staircase. He was found helpless at the foot of the stairs and died in ten minutes. This may have been the result of a bad dream or an attack of senile delirium. My father had an attack of senile delirium on a train. It was a hot day and he was much fatigued. During the first day or two of the attack if his eyes had been bandaged he would certainly have taken the bandages off. The delirium did not differ in any respect from that described by Dr. Parker. I believe the senile aspect must be considered and it is possible that my patient had recovered from the delirium following the operation and that the disturbance in which the fatality occurred was a secondary affair.

Dr. Melville Black, Denver: It seems to me the thing to be especially considered in these cases is to afford absolute mental rest. This can be accomplished by many operators through suggestion. Not all of us, unfortunately, are given the same power in that direction. I have endeavored to give my cataract patients absolute mental and physical rest by the administration of 1/8 grain of morphin a half-hour before the extraction, repeating the dose six hours later. This makes the patients quiet even if they are not asleep. Their minds are at rest and they are not worrying over the possibilities of the outcome. I think we are absolutely justified in saying to the patient that the operation is a simple one and that there can be absolutely no doubt of a perfect result. It would be proper, as a matter of precaution, to explain to the other members of the family the risks to be taken, but the patient should be given the idea that there is no possibility of failure. I think this has a great deal to do with the outcome in these cases. Another point is to get these patients out of bed. I usually operate in the afternoon between 3 and 5 o'clock while the light is still good, and the next morning when I see the patients I ask them if they want to get up. They invariably say yes, and I have no objection to their sitting up. The recumbent position is often restful to many people, but not so to others. The idea is to give them rest and I believe this is not only permissible but advisable. There are a great many factors to be considered from the standpoint of the individual patient.

Dr. William Zentmayer, Philadelphia: I want to cite a case showing that it is not always the removal of patients from their homes which is responsible for the delirium. This case occurred early in my practice. An elderly man was operated on in his home. On the second day after the operation, because of the illness of the surgeon, I was called to see the patient, who was in violent delirium. He recovered under scopolamin and croton oil, which I believe I was foolish enough to give him. A second case had so many contributing factors that the direct cause of the delirium is obscure. An elderly woman was brought from a distant city for extraction of a cataract from an extremely myopic eye. She had been practically blind for three years. The immediate operation was successful, but she was in the hospital for three weeks with a low-grade iritis. She was then sent to the suburbs against her wish. She knew that her home in which she had lived for many years was to be closed during her absence. The day before the attack her son came to visit her. She also knew I was going away. The night before I left she was taken with a delirium which lasted throughout the night. I saw her early the next morning and found her somewhat improved but I have not learned the outcome.

Dr. S. D. Risley, Philadelphia: I have seen many cases of postoperative delirium and while the majority of the patients have recovered I have seen enough cases prove serious to make me anxious about them. For example, one man left his bed, jumped from the second-story window and was killed. I am sure that being left in the dark is not always the cause of the delirium but I have seen the delirium disappear after removal of the bandage from the unoperated eye. I was interested in the remark made by Dr. Black about the administration of morphin. I do not as a rule approve of the administration of morphin after the extraction operation, or any other, because it is apt to conceal symptoms and disturb the general nutrition of the patient. In most cases of postoperative delirium I believe it is theoretically correct to administer a cerebral stimulant. The morphin or some preparation of opium should be administered, if at all, in small doses, but instead of the opium I prefer hyoscyamin or stramonium in small doses. In some cases, however, I have found more prompt relief from stimulating tonics. A routine mixture of mine for old people after operation is the tincture of nux vomica, compound tincture of cinchona and compound gentian. In two instances I have seen the delirium disappear after the man was taken out of the room and given his pipe. Patients have asked if they could smoke and I have told them they could have a dry smoke. I get old people out of bed as soon as possible. It is a serious thing to put a man 75 years old in bed away from his usual environment and activities.

Dr. Walter R. Parker, Detroit: In practically all that has been written on the subject the argument is made that senility is not the only etiologic factor in postoperative psychoses or the delirium would be much more frequent. A predisposition to some psychoses, associated with senility, is generally the determining factor. My experience agrees entirely with that of Dr. Risley in regard to the treatment of these cases. In every case the unoperated eye has been unbandaged as soon as the delirium was discovered and usually the patient improved mentally. Scopolamin, morphin and bromids have been used and in some cases appeared to have good effect. One patient, however, was made much more delirious for a short period by a dose of scopolamin. I cannot name any one drug as being of special benefit in routine treatment. I believe we do not give enough attention to the general welfare of these cataract patients. After the operation I put the patients immediately in a small ward with two beds and a special nurse. They remain there until the anterior chamber is closed and then they are put in the general ward. Two cases developed a delirium immediately on being placed in the general ward. If these patients could have remained in a private ward under the care of a nurse it is possible the delirium would not have developed.

Duodenal Ulcer.—In the early days of our recognition of this condition we were assailed by a formidable array of post-mortem statistics which went to show the rarity of the disorder, and the absence or the inconstancy of any symptoms which could be attributed to it during the life of the patient. We now know that the great frequency of the disease—every month I operate in more cases than were formerly recognized in the post-mortem room of the largest hospitals in ten years—and the assertion may truthfully be made that of all abdominal diseases none can be more certainly discovered by a scrutiny of the anamnesis alone.—Sir Berkeley Moynihan, Address in Surgery, Brit. Med. Assn., 1913.

THE SURGICAL TREATMENT OF A CERTAIN TYPE OF PENETRATING WOUNDS OF THE SCLERA, BY MEANS OF A DOUBLE CONJUNCTIVAL FLAP

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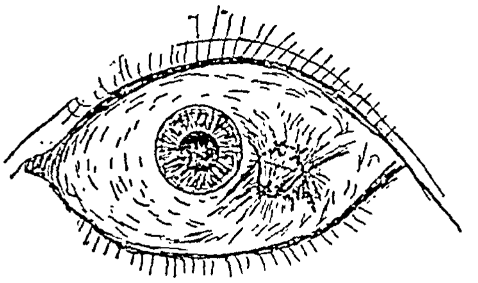
BUFFALO

The use of some form of conjunctival plasty to close and reinforce penetrating wounds of the sclera is a too well-established principle of surgery to need elaboration, although, when Kuhnt published his work, as great a surgeon as Herman Knapp expressed himself as being somewhat dubious as to whether Kuhnt had materially improved on Nature's way. To Kuhnt, of course, belongs credit for having been one of the foremost and most persistent advocates of the use of the conjunctiva in ocular wounds. Nothing of an essentially fundamental nature can be added to the surgical principle as has been set forth by him.

It is the purpose of this paper to discuss the surgical treatment of a certain type of penetrating wounds, in reference to the advisability of the use of scleral sutures, and to call attention to a method of sealing the wound by means of a double conjunctival flap in such a way as to avoid their use if possible. After a review of the current books on ocular surgery, it may be said that most authors divide penetrating scleral wounds into two groups: those not requiring scleral sutures and those that do; such a division being based on the liability of wounds to gape. In the first class are placed wounds of less than 3 mm. and into the second fall those of 3 mm. or more. Such a division, of course, is not to be taken literally, as the individual case may warrant modification. In the main, however, it expresses the sentiment of many conservative surgeons. Something more than mere size must naturally enter into such a consideration; especially is this true as to the location of the wound in regard to tension from the neighboring ocular muscles; a wound situated so as to be exposed to the direct pull of internal or external rectus is more apt to gape than one further removed.

The end sought by all surgical procedures is the rapid and firm coaptation of the wound lips, and formation of as thick and unyielding cicatrix as is possible, looking forward to the avoidance of subsequent cystoid bulging. It has been shown that the healing process in scleral wounds is not one of direct adhesion but of a deposition of new connective tissue. The source of this new scar tissue is not the sclera, according to Lublinsky, but the conjunctiva and chorioid. If these observations are correct the sclera itself plays quite a passive rôle, providing merely a basis on which the scar is built up by cells which are of conjunctival or chorioidal origin. As far as the sclera is concerned the surgical problem is entirely one of drawing and holding the wound edges together, so as to permit the conjunctival and scleral tissues to do their repair work best. While this fact alone does not present a powerful argument against the scleral suture, it deserves consideration. Of still more moment is the almost necessarily severe manipulation which scleral stitching involves. Scleral tissue is too tough and resisting to admit of ready suturing. Along with the added surgical trauma goes the danger from loss of vitreous. If the conjunctiva can be manipulated in such a way as to exert enough traction on the wound margins to bring and hold them together, and at the same time to provide an ample reinforcement, then the more difficult scleral suture may be avoided, and with the added insurance of a firm scar.

The type of penetrating scleral wounds, to which the following procedure is applicable, must of necessity be those located far behind the corneoscleral junction, to admit of relatively free elevation on all sides of the neighboring conjunctiva. It is further assumed that such wounds fall under the group of those which, according to sound surgical principles, are favorable for closure. It includes, however, those of any shape or extent, whether ragged or smooth. First of all, tags should be trimmed down, presenting vitreous clipped, and the wound edges made ready for coaptation. It is in this step of the procedure that I think I have an improved technic. At any rate, I have not seen this method described in anything I have at hand. By means of strabismus or tenotomy hook, the conjunctiva on all sides of the lip of the wound is freely loosened from the sclera. In a radial wound, it is my practice so to free the conjunctiva on each side, for about a quarter of the way around the eyeball and to a relative extent in the other directions; if equatorial, as far forward as the corneoscleral junction. Double-armed fine silk sutures, one or two, depending on the size of the cut to be closed, are then placed in the margin of one of the newly made conjunctival flaps. The needle or needles, as the case may be, are then carried well up under the other flap, brought to the surface and firmly knotted. The result is to tuck up one flap under the other and bring one layer of intact conjunctiva over the scleral wound. The surface of this flap is then carefully abraded, usually by gentle scraping with a knife. The remaining conjunctival flap is then brought over the first and stitched down in the opposite direction. When completed the wound is closed by the second layer of healthy conjunctiva and correspondingly reinforced. In drawing over the flaps, in the manner just indicated, it is important that the sutures be snugly drawn and firmly knotted. Otherwise one of the most important features of the operation will be lost, namely, traction on the globe in such a way as to bring together the scleral edges and hold them firmly in place.



The dotted line shows the outline of the under flap which is tucked up under the upper flap. The lines of traction on the two flaps are so arranged that the wound lips are held in firm apposition.

If, however, the wound is of such size and location that the operator does not care to trust entirely the conjunctival flaps, and deems it wise to close the sclera as well, this should be done before the conjunctival flaps are freed. The surgeon has the choice of several suture materials. As these sutures are to be buried, they must be absorbable. Very fine catgut, kangaroo and rat-tail tendon, are to be had. Of these the latter appears best adapted to the work in hand. It is strong and yet extremely pliable. This latter property minimizes the size of the suture canal. Whatever material is chosen, lubrication with sterile olive oil or petrolatum will facilitate stitching and also give the added advantage of filling the suture canal with an aseptic material. If not of greater, certainly of equal importance as the choice of suture material is the absolute necessity of sharp, fine needles. A dull-pointed, thick needle causes immeasurable and irreparable damage, while a sharp, fine needle not only facilitates the placing of stitches but reduces danger from added traumatism. Whether the stitches should include the entire sclera or whether they should be only episcleral is a question which I do not pretend to decide any further than to say that in my own experience, I have ever found the latter satisfactory, both in immediate results and in cases seen seven years after operation.

The above-described technic is available whether or not scleral sutures are thought necessary. I have not used the scleral sutures since this procedure was adopted, although a fair amount of these kinds of accidents have been dealt with at the Emergency Hospital and other hospital services and in private practice. Since the double flap method, as described, has been employed, I am convinced, in my own mind at least, that the results have been more satisfactory, healing more prompt and kindly than when the single flap or plain conjunctival sutures were employed. Such a statement is, however, open to the just criticism that there is no ground for a fair comparison.

The following points are mentioned in favor of double flap as compared with the single:

1. Because of the traction exerted by the two flaps, the scleral wound lips are held in firm apposition. Consequently, relatively large scleral wounds may be rapidly and safely closed without stitching the sclera.

2. The resulting scar is thicker, firmer and more unyielding.

3. Two layers of sound conjunctiva protect the contents of the globe from outside infection.

575 Delaware Avenue.

ABSTRACT OF DISCUSSION

DR. JOHN A. DONOVAN, Butte, Mont.: This operation is well worth a fair trial. It may be that the additional support of the double flap will prove of decided advantage where closure is indicated, as of course it is in many cases. There seems to be no specific treatment applicable to any two particular injuries. The question comes up as to the necessity of closing the wound at all, or whether by just letting the two edges come together we would not get a better circulation. Many of the patients I see are injured in the shops and on the railroad many miles away, so that it is a day or two before they get in and in many instances the wounds are already closed. If there is no foreign body in the eyes I invariably leave them closed. The results of leaving them alone are better than interfering. I have found in practically all injuries the less you do the better off you are. The greatest danger of infection is at the time of the operation. When I see a bad wound in the sclera, with the vitreous protruding, I have been inclined to get the eyelid closed as quickly as possible, and unless I see decided indications to the contrary, notwithstanding the authorities who say that they should be covered, my results have been quite good from cleansing the wound, closing the eyeball, making gentle pressure and leaving it alone.

DR. W. H. WILDER, Chicago: The question of whether or not it is best to suture scleral wounds is, of course, an important one. I have found that there are a number of cases in which this could be done satisfactorily without putting in an absorbable suture. I have made use of a little procedure which I have not seen described and which has proved satisfactory in the few cases in which I have used it. It is applicable to any wound in the sclera. The method must be adapted to the wound; in other words, we cannot have anything like a typical operation in these cases. The conjunctiva is loosened for a considerable distance around the scleral wound, which is then carefully freed of any prolapsed chorioid or ciliary body. A fine silk suture, doubly armed with fine needles, is then passed through the lips of the scleral wound, and both needles of the suture are passed through the conjunctiva near each other at a point some distance from the edge of the wound in the conjunctiva. If the conjunctival flap is now drawn over the scleral wound the suture, when tied, will close the wound in the sclera and yet be on the outside of the conjunctiva so that it can be readily removed when desired. The flap of conjunctiva can then be secured under the opposite loosened conjunctiva by sutures similar to those used in transplanting a pterygium by the McReynolds method.

Dr. Allen Greenwood, Boston: There are two or three things to be remembered. An eye, usually from which some vitreous has escaped, must be handled with great care, making this one of the most delicate operations in ophthalmic surgery. If you do not sew up a wound in the sclera in an eye that has a protrusion of vitreous and ciliary body, the eye is pretty sure to be lost, and I know of some eyes that were saved by what I would call conservative surgery. In one case in which the fundus of the eye could be seen through the wound in the sclera I did an advancement of the conjunctiva underneath the upper layer, being careful that neither my assistant nor I made any pressure on the eyeball. The man has good vision to-day and I feel that if it had been left open I never would have secured so good a result. These operations apply particularly to the cases a short time after the injury. Dr. Donovan sees his cases much later, which gives us a different problem. I think Dr. Francis has given us a valuable suggestion.

Dr. Lee Masten Francis, Buffalo: The point of this procedure is to avoid stitching the sclera, which perhaps in the experience of an operator such as Dr. Wilder is not important, but it is something which I approach with a great deal of respect. I believe that a relatively large scleral wound can be closed with the double conjunctival flap, and the strong point about the procedure is that the flap not only covers the wound but it exercises traction on the wound along proper lines.

PRIMARY LUES OF THE BULBAR CONJUNCTIVA

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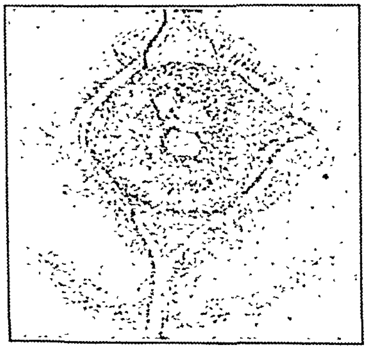
Statistics show that six or seven out of every hundred cases of chancre are extragenital. Fournier[1] says, "I think the proportion of 9 or 10 per cent. would not be too high for extragenital chancres." Although they have been noted on all parts of the body, literally from head to toe, the ophthalmologist rarely meets this condition. Thus Zeissl, in 4,000 cases of syphilis, observed only two chancres on the lids, while Boeck of Christiania had one patient with palpebral chancre in 2,344 cases. In 642 cases of extragenital chancre, Fournier observed only seven on the eyes or lids (location not stated). Bulkley[2] personally observed 113 cases of extragenital chancre, four of which were on the eyelids. He has tabulated 9,058 cases, 372 of which were of the lids or conjunctiva.

In relative frequency, the structures of the eye which may be involved, are, according to Ronvillois[3]: the ciliary margin, skin of the lid, palpebral conjunctiva, culdesac, bulbar conjunctiva (scleral portion, inner angle and caruncle), limbus and cornea. The location of extragenital chancres about the eyes in the ninety-four cases collected by deBeck[4] was as follows: thirty-five on the lower lid margin, inner surface and culdesac; twenty-five on the inner angle and caruncle; twenty-four on the upper lid and culdesac; six on the ocular conjunctiva; four on the skin. The frequent involvement of the commissures and lid margins is due to the maceration of the epithelium by tears, and the resulting ulcerations, excoriations and blepharitis, offering opportunity for infection. The caruncle, plica semilunaris and lid margins are frequently irritated by scratching with the fingers.

Up to the present I have succeeded in finding but twenty-one cases of chancre of the bulbar conjunctiva, and of these only three were at the limbus. The report of a case of chancre of the limbus follows:

M. W., aged 37, an unmarried woman, was referred to me, June 18, 1909. She began the care of her sister's 3-weeks-old infant, March 25, 1909. The child showed evidences of hereditary lues. It weighed less than 6 pounds, was prematurely born, and had the appearance of an old man; the head was large and the skin was wrinkled. Its cry was weak, and it had spots on the face and body, blisters about the anus and between the fingers, a discharge from the nose, and bleeding from the mouth. The child died when it was 4 months old.

Present Illness.—May 25 the patient had a sudden pain in the left eye. She thinks that the eye may have been inflamed several days, as the upper lid covered the part of the globe most involved. The eye became very red, there was considerable lacrimation and the lids were moderately swollen. The pain was so severe that for several nights she walked the floor, being unable to sleep. The pain stopped rather suddenly two days previous to my examination, June 18, 1909.



Primary lues of the bulbar conjunctiva.

Examination.—V. O. D.=6/5. V. O. S.=3/50. The lids were entirely closed, owing to swelling. There was marked chemosis of the bulbar conjunctiva, of a deep dusky red, which extended above to the culdesac. On the bulbar conjunctiva, in the superior temporal quadrant, at the limbus, was a hard crescent-shaped area 1.4 cm. in diameter. This extended on the temporal side to below the level of the pupil, and was raised about 2 mm. above the level of the cornea. The center was occupied by a dirty, grayish-yellow necrotic area, with deep, sloping, regular edges. The ulcer was oval in outline, measuring 4 by 6 mm. The long axis was horizontal. The lower edge of the ulcer extended to the cornea. The latter was not ulcerated, but showed a deep infiltration in the portion near the ulcer. The pupil was dilated with atropin. The fundus was not distinctly seen on account of haze of the cornea. The left preauricular lymph-node was hard but not tender, and measured about 1.5 cm. in diameter. There was also some enlargement of the submaxillary lymph-nodes.

Diagnosis of chancre was made, and the patient put on inunction of mercurial ointment. Cultures showed staphylococci, and *Spirochaeta pallida* was found in the scrapings from the ulcer.

Subsequent History.—July 20 the ulcer was healing, the chemosis was less, the conjunctiva was becoming pale, but slight induration was still present, and the preauricular lymph-node was enlarged. The inunctions were discontinued and mercury, 2/5 grain three times a day in the form of an enteric pill, was ordered. Sept. 1, 1909, the eye was white and there was a white scar on the upper part of the cornea. V. O. S. = — 0.50$_s$ + 2.00 cyl. axis 90° = 6/9 +. The patient was seen again November 23, with an iritis in the left eye. This along with a papular rash commenced two weeks previously. Innunctions were ordered again, as the patient had neglected her treatment for over a month. December 6, an iritis appeared in the right eye. The attack of iritis in the second eye was of short duration. Both eyes were white, December 22, Sept. 20, 1910, V. O. S. = 6/12 with glass.

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[1] Fournier, J. A.: Treatment and Prophylaxis of Syphilis, Am. ed.

[2] Bulkley: Syphilis of the Innocent, New York, 1894.

[3] Ronvillois: Rev. gén. d'opht., July, 1909.

[4] DeBeck: Hard Chancre of the Eyelids and Conjunctiva, Cincinnati, 1886; Tr. Am. Ophthal. Soc., July, 1886.

ANALYSIS OF CASES

In a review of the literature quite a large number of cases of chancre of the caruncle and culdesac were noted. these are, of course, not included in this paper. Of the twenty-two cases of chancre situated on the bulbar conjunctiva, seventeen are reported in French literature.

Eye Involved.—The lesion was situated in ten cases on the right eye, in six on the left, and in six cases the location was not given.

Age.—All these cases, except one, have been in adults. This is rather remarkable when one considers how much infants and children are kissed and fondled. Ages reported by different writers are as follows: 6 years, DeWecker;[5] 18 years, Williams;[6] 22 years, Sans Blanco;[7] 23 years, DeWecker;[5] 24 years, Ronvillois,[3] Baudon;[8] 25 years, Valude and Laur;[9] 26 years, Horand,[10] Clergerie;[11] 27 years, Morax,[12] Fanc,[13] Maslenikow;[14] 30 years, Pelissier,[15] DeWecker;[5] 35 years, Sourdille,[16] DeSchweinitz,[17] Sbordone;[18] 37 years, my case.

Sex.—Nine males and thirteen females were reported.

Occupation.—Two married women, 5 nurse-maids, 3 laborers, 2 physicians, 1 football player, 9 not stated. The number of nurse-maids shows the danger of infection from syphilitic infants.

Situation of Chancre.—Eight were on the nasal position of bulbus; 2 on the inferior nasal quadrant; 1 on the inferior; 1 on inferior temporal side; 4 on the temporal side; 4 at the limbus (1 each on the nasal, inferior and superior portions), 2 not stated.

Mode of Infection.—1. Direct: By kissing or coughing, the saliva from a person with mucous patches may infect another, as in the cases of Hogge,[19], DeWecker[5] (two cases), Sourdville,[16] and Sans Blanco.[7] Fournier[1] treated five cases of chancre of the eye (situation not given) among his medical colleagues, the infection being transmitted in each case by the patient coughing or spitting, while having the throat examined. Three of these washed their faces immediately after the occurrence. As he says, this does not show the futility of washing, but rather the necessity in such cases of complete ablutions with antiseptics, such as mercuric chlorid (1:1,000).

DeSchweinitz[17] reports the case of a physician who developed a chancre of the bulbar conjunctiva as a result of some secretion entering his eye, during attendance on a case of parturition. The practice among some people of using the tongue to remove foreign bodies from the eye may prove a source of infection. Fournier[1] mentions an account of an epidemic of syphilis described by a Russian physician, Tepljaschin, which was introduced into two villages by a "magician," who professed to cure trachoma and to remove foreign bodies from the lids, with the tongue. Sixty-eight persons were contaminated; eight of the first victims developed chancres of the eyelids. DeWecker's[5] third case and probably Horand's[10], are examples of this.

2. Indirect: The infection may be carried to the eye indirectly by the fingers, as in the cases of Ronvillois and Sbordone. The cases reported by Williams,[6] Baudon,[8] Dagneloiski,[20] Morax,[12] Clergerie[11] and by me likewise come in this class, a luetic child in each case being the source of the infection, and its caretaker the one infected.

3. Mediate: Infected surgical instruments, towels, handkerchiefs and sponges may spread the contagion. Such is, however, probably unusual and difficult to trace.

Period of Incubation.—This is difficult to determine, as generally the time and mode of infection are not known. In DeSchweinitz'[17] case the lesion developed six weeks after the infection took place. Ronvillois'[3] case developed less than one week after the supposed infection, a scratch from a finger. The short time of incubation in this case is against the scratch as the cause of the infection. Ten days is the shortest time given for the period of incubation of a chancre.

SYMPTOMS

Onset.—This generally resembles a mild conjunctival irritation, with localized redness. There is slight lacrimation but no secretion. Pain has been noted in only those cases in which the chancre was situated at the limbus. The redness changes to a papule-like area, the center of which becomes necrotic, forming an ulcer.

Stage of the Developed Chancre.—Ten days to two weeks after onset, the condition is characterized by chemosis; an ulcerated area surrounded by a red, raised, indurated ring, and an enlargement of the preauricular, and frequently the submaxillary gland. The chemosis is marked, involving the bulbar conjunctiva and extending into the culdesac. It is red, gelatinous-like, and has the appearance of subconjunctival injection of oil. The color has been described as wine-red, yellow-red and copper-red. It appears at about the same time as the ulceration, and continues some time after the latter is healed.

Ulceration.—This is probably present in every case. It is generally single, but may be multiple. Vignes',[21] Sourdille's[16] and Ronvillois'[3] patients each had two ulcers; Dagneloiski's[20] three. These multiple ulcers may unite and form one large area. The size of the ulcer is generally about 4 by 6 mm., and is round or oval in outline. It is of a dirty grayish-yellow, and has been described as diphtheritic or mucous-like, with an opalescent appearance. The exudate is of a mucoid consistency. The edges of the ulcer are fairly high, sloping and regular in outline. The chancre is typical, a raised dusky red, indurated area, of the consistency of cartilage, not tender or painful. In appearance it is like a button with a punched-out yellow center. In size it averages about 15 mm. in diameter.

Corneal Involvment.—Cloudiness of the cornea was present in the case reported by Fano.[13] DeSchweinitz's[17] case is unique in the development of a vascular keratitis. This subsided after the disappearance of the lesion of the bulbar conjunctiva, leaving a slight haze to the cornea.

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[5] DeWecker: Cited by deBeck (Footnote 4).

[6] Williams: Liverpool Med.-Chir. Jour., 1884, iv, 195.

[7] Sans Blanco: Arch. d. Oftal. Hispano-Americanos, T. I. 1901, p 32.

[8] Baudon: Rec. d'ophtal., 1885, vii, 673.

[9] Valude and Laur: Ann. de dermat. et de syph., 1897, Part 3, p. 294.

[10] Horand: Traité pratique des maladies vénériennes, Jullian, 1886, p. 587.

[11] Clergerie: Arch. d'ophtal., 1910, xxx, 43.

[12] Morax: Ann. d'ocul., 1900, p. 297.

[13] Fano: Jour. d'ocul. et de Chir., Nov. 25, 1874.

[14] Maslenikow: Arch. d'ophtal., 1902, p. 540.

[15] Pelissier: Thèse, Lyon, 1904.

[16] Sourdille: Gaz. méd. de Nantes, 1900, xviii, 113.

[17] DeSchweinitz: Ophth. Rec., 1898, vii, 144.

[18] Sbordone: Movimento, Napoli, 1882, xiv, 155.

[19] Hogge: Ann. Soc. de méd. de Liége, 1894, No. 33, p. 94.

[20] Dagneloiski: Ann. d'ocul., 1895, cited by Pelissier (Footnote 15).

[21] Vignes: Soc. d'ophtal., Paris, Nov. 7, 1893; Ann. d'ocul., 1893, cx, 358.

Pain.—This has been noted only in those cases in which the lesion was located at the limbus (Fano,[13] Maslenikow,[14] Sbordone,[18] myself).

Period of Healing.—The ulceration gradually becomes smaller; at the same time the chemosis disappears, and the conjunctiva blanches. The induration persists some time after the chemosis and ulceration. The ulcer is finally replaced by a white scar, or, as described by others, by a copper-colored area. The course of the disease is generally from six to ten weeks.

Adenopathy.—The preauricular lymph-node on the same side is enlarged, hard, but not tender, and does not break down. In one case, Ronvillois',[3] the preauricular lymph-nodes of both sides were enlarged. In about half the cases the submaxillary lymph-nodes were enlarged. The adenopathy is contemporaneous with the ulceration and the chemosis. The secretion is scanty; lacrimation is present.

Pathology.—Only one case (Sourdille's[16]), has been examined microscopically. Sections were made so as to include the entire thickness of the lesion. The picture was characteristic of chancre. The infiltration of lymphoid cells was especially marked about the numerous blood-vessels, forming a kind of perivascular "cuff." Multinucleated epithelioid cells and leukocytes were also present. The endothelium appeared normal, but the tunica externa was thickened and many vessels contained thrombi. This infiltration gave rise to the cartilage-like hardness. The epithelium over the ulcer had disappeared, and the base consisted of a necrotic mass. The loose subconjunctival tissue was infiltrated by a serous coagulum in which were a few round cells. The thrombosis of the vessels was the cause of the ulceration and chemosis.

DIAGNOSIS

In the early stage the diagnosis is difficult. The condition might easily be mistaken for conjunctivitis, episcleritis or a phlyctenule. At the end of two weeks, when the chancre is developed, diagnosis should be certain, if the condition is thought of. Marked chemosis, ulceration, induration and enlargement of preauricular lymph-nodes are constant. To this may be added lacrimation and absence of pain, unless the chancre is situated at the limbus. The diagnosis is made absolute by the demonstration of the *Spirochaeta pallida.* The Wassermann reaction is not positive before the third or fourth week. The following several conditions might be confused with chancre:

Chancroid.—The induration about the ulcer is absent. The edges are sharp-cut, there is more or less itching, and there is an abundant secretion, in which the bacillus of Unna-Ducrey is found.

Tuberculosis.—The disease appears in several clinical forms. The lesions may consist of several rounded areas, similar to phlyctenules, or these may be multiple small ulcers, from 3 to 5 mm. from the limbus. The secretion is scanty, although in the large ulcers with rough, overhanging, granular, indolent edges, the secretion may be profuse. In these cases there is no chemosis, and the hard infiltration of the ulcer margins is absent. The pain is often severe. The disease is chronic and of long duration. The tuberculin test, the demonstration of tubercle bacilli or animal inoculations would determine the diagnosis.

Scleritis, a form of tuberculosis, is characterized by a slightly raised area of violaceous tint, showing no ulceration, no chemosis or adenopathy, but is tender on pressure, with considerable pain and photophobia. The condition is chronic and a local and general positive reaction to tuberculin would be obtained.

Herpes.—This is characterized by blister-like areas of the eye and forehead with severe pain.

Phlyctenule.—This is generally multiple, and is most common in children. Pain, adenopathy and chemosis are absent. Under treatment it rarely lasts over two weeks.

Gumma.—This appears as a round mass. The history of a previous chancre, or a positive Wassermann and the absence of adenopathy and chemosis, with the rapid growth, would characterize this condition. Ulceration, when present, is deep, circular and gray.

Secondary Syphilitic Papules.—I have recently had a case that showed three syphilitic papules of the bulbar conjunctiva. These resembled, in a way, the appearance of a chancre in the papule stage. The presence of other papules or evidence of such on the skin or on some other part of the body, the history of chancre, and the absence of ulceration and induration suffice to make the diagnosis.

Tumor.—Epithelioma would be most likely to be found in an old person. The slow growth of a neoplasm and the absence of chemosis and inflammation would distinguish it from a chancre.

Diphtheria.—The membrane would be extensive, the disease of from only six to ten days' duration, and the secretion abundant and sanguineous. Cultures and animal inoculation would settle the diagnosis.

Parinaud's Conjunctivitis.—This is characterized by numerous pedunculated masses of conjunctiva which later form superficial ulcers. Numerous small yellow nodules are present in the subconjunctival tissue. There is no induration of the conjunctiva. The chemosis is marked, however, and the preauricular lymph-node is swollen. This often suppurates.

PROGNOSIS AND TREATMENT

A chancre of the conjunctiva heals without permanent injury to the eye, the only evidence being a small white scar. When the lesion is located at the limbus a slight nebula of the cornea may remain; as this is not central, vision is not diminished.

The eye should be kept clean by some mild antiseptic solution. The use of calomel as a dusting-powder is recommended. Salvarsan or neosalvarsan should be given as soon as the diagnosis is made.

SYNOPSIS OF REPORTED CASES

CASE 1.—Fano,[13] 1874. Man, aged 27, cooper. Mode of infection not known. Patient gave history of having slept with a companion (syphilitic?) for seven months. Right eye was red one week. September 28 the palpebral conjunctiva was edematous. On the inferior nasal portion of the limbus was a plaque of a dirty white color, quadrangular, and the size of a lentil. This is described as being an edematous pad, of a wine-red color with a hole in the center. The cornea was slightly cloudy. The patient complained of severe and constant pain in the eye and lid, requiring the use of opium. November 7, papular eruption appeared on the side of the nose, and a discrete maculopapular eruption on the body. November 13, ulceration was reduced in size, chemosis was disappearing, and November 20 there was only slight induration and edema.

CASE 2.—Horand,[10] 1886. Man, aged 26. Bulbar conjunctiva of left eye showed marked chemosis. On the nasal side was a large red papule with an indurated base. The preauricular lymph-node was large. Cornea free. Source of infection was probably from saliva of brother who had lues. Patient later developed papular eruption and mucous patches.

Case 3.—Baudon,[8] 1885. Woman, married, aged 24. Disease of one month's duration. August 18, examination showed swelling of the bulbar conjunctiva below the equator of the eye, but extended all around the cornea as far as the upper culdesac. The cornea was healthy, but was surrounded on all sides by a hard resistant ring, the base of which attained the size of a cherry. Tumor was hard and covered by a white exudate, but did not have the resistance of an epithelioma. The preauricular and submaxillary glands reached the size of cherries. October 5, tumor had disappeared and patient showed mucous patches in her throat. Later her baby showed ulcerated plaques.

Case 4.—Williams.[6] Girl, aged 18, nurse to a child with hereditary syphilis, developed chancre of bulbar conjunctiva between cornea and inner commissure. Preauricular lymph-nodes enlarged. Yellowish slough ¼ inch long, hard to the touch and adherent to the tissue beneath.

Case 5.—Vignes,[21] 1893. Male, age not given. Patient developed two ulcers of the bulbar conjunctiva with enormous chemosis and slight secretion. Preauricular and submaxillary lymph-nodes were enlarged.

Case 6.—Dagneloiski,[20] 1895. Female, nurse to a syphilitic infant, developed two lardaceous ulcerations in the inferior fornix and third papule on the bulbar conjunctiva.

Case 7.—Delow,[22] 1895. Male. An elevated ulceration was present on the internal part of the bulbar conjunctiva. It had a lardaceous aspect, with cartilaginous base. Chemosis was marked. Preauricular and submaxillary lymph-nodes were enlarged. Two months later the patient developed mucous patches in the mouth.

Case 8.—Valude and Laur,[9] 1897. J. X., aged 25, gave history of onset three weeks previous. Examination showed redness of bulbar conjunctiva of right eye on level of the nasal angle. Two weeks later a small button-like area appeared. This rapidly increased in size. Examination showed within the palpebral fissure, nasal side, about 2 mm. from limbus, a small hard tumor the size of a lentil. The form was oval, long axis vertical, base dark red, surface flat and covered by a diphtheritic exudate. Removal of this showed erosions beneath. Conjunctiva was injected, there was no pain, and only slight secretion. Preauricular lymph-node was hard and swollen, but not tender.

Case 9.—DeSchweinitz,[23] 1898. Physician, aged 35, infected by some uterine fluid during the delivery of a child. Face wiped at the time by an attendant. Conjunctival irritation appeared six weeks later. This developed into a typical chancre of the bulbar conjunctiva. Cornea and iris were not involved. Preauricular lymph-node enlarged. "With the disappearance of the lesion on the bulbar conjunctiva and during the process of its subsidence, there developed in the upper half of the cornea a form of vascular keratitis, not unlike that which is seen in the pannus of trachoma, the blood-vessels being superficially placed beneath the epithelium, and the gray infiltrates occupying partly the epithelial layers and partly the superficial layers of the true corneal tissue. Gradually, assisted by the internal administration of potassium iodid and mercuric chlorid, the corneal lesions disappeared, and at the last examination, nine years after this condition, there was no trace of the lesion on the bulbar conjunctiva and only faint haze of the upper part of the cornea. Vision of the right eye after the correction of a mixed astigmatism was $+ 1.00_s - 2.75$ c. axis $5 = 6/12$."

Case 10.—Morax,[12] 1900. Woman, aged 27. Slight ocular irritation, March 18. Examination, March 23, showed lacrimation, and enlargement of preauricular lymph-node; later a swelling appeared behind the angle of the jaw. March 29 there was acute chemosis of the bulbar conjunctiva. An area corresponding to plica semilunaris was raised, of a violaceous tint and covered by a diphtheritic exudate. This was not detached by light friction. It was in the form of an oval 6 by 4 mm. with the long axis vertical; the cornea was clear. Infection was derived from syphilitic child.

Case 11.—Sourdille,[10] 1901. Woman, married, aged 35. Right eye. Onset ten days previous. Examination, O. D., October 18: On the bulbar conjunctiva between cornea and semilunar fold and below a horizontal line passing through the pupil were two superficial ulcerations, opal in color, each 4 by 5 mm. in diameter, and separated from each other by a bridge of conjunctiva from 1 to 5 mm. wide. The conjunctiva was wine-red. About this was an area, 12 mm. in diameter, of the consistency of cartilage. Conjunctiva was chemotic. There was no pain, photophobia or secretion. No visual disturbance. Preauricular lymph-node was enlarged. Patient treated for episcleritis. October 24, induration larger and thicker; 15 mm. in diameter; the two ulcerations had united. Conjunctiva was of a yellowish-rose color, and infiltrated so as to form a hard flesh-like mass with the cornea in the center. November 20, chemosis began to diminish. December 4, specific eruption appeared on body. Infection probably due to being kissed on the eye.

Case 12.—Maslenikow,[14] 1901. Male, aged 27. Right eye became red one month previous. Fifteen days later swelling appeared. Examination showed at the limbus a small mass having the appearance of a phlyctenule. Eight days later this formed an ulcer surrounded by a ring of cartilaginous consistency. Preauricular lymph-node was enlarged. Later mucous patches and skin eruption appeared. Mode of infection not known.

Case 13.—DeWecker,[5] 1865. Woman, aged 30. Ulcer on the bulbar conjunctiva, left eye, situated 0.5 cm. below and on temporal side of the cornea. This resembled a large ulcerating pustule, with a pultaceous floor; the surrounding tissues were livid; ulcer of long duration. Preauricular lymph-node swollen. Infection due to kissing on the lids.

Case 14.—DeWecker,[5] 1873. Woman, aged 23. Indurated ulcer on the conjunctiva of the left eye, situated on the temporal side of the cornea. Preauricular and occipital lymph-nodes swollen. Infection due to kissing on the lids.

Case 15.—DeWecker,[5] 1878. Girl, aged 6. Ulcer on the inferior and external part of the bulbar conjunctiva, right eye. Preauricular lymph-nodes were swollen. Infection due to mother using her saliva to clean child's eye.

Case 16.—Pelissier,[15] 1904. Woman, married, aged 30. Ten days previous to examination the left eye became red. Examination, October 21, showed chemosis, with red brawny cartilaginous area, in the inferior nasal quadrant. Chemotic conjunctiva surrounded the cornea. Lacrimation present, but no secretion. Lids slightly adherent in the morning. Preauricular lymph-node was the size of a hazelnut. Husband admitted chancre (genital) two years previous. He then had mucous patches in the mouth. October 26, chemosis greater, so as to cover edge of cornea, chancre larger, size of 20-*centime* piece. No pain. Submaxillary and parotid glands enlarged. December 19, secondary roseola appeared on the body with redness of palate and tonsils. January 19, patient showed nasal syphilis. February, mucous patches appeared on the tonsils.

Case 17.—Ronvillois,[3] 1909. Man, aged 24, scratched right eye while playing football. Following day eye was red and watery. No pain. Examination one week later showed marked chemosis with a red crescentic fold between limbus and caruncle. An ulcer 4 by 2 mm. with two smaller areas were present on the upper part of this fold, and a similar one on the lower part. These ulcers were yellowish and covered by a diphtheritic exudate. No secretion. V. O. D. = 2/3. No pain. Cornea clear. Preauricular and submaxillary lymph-nodes on both sides were enlarged and hard but painless. Preauricular lymph-nodes on opposite side larger than that on the side of the lesion. A roseolar rash later developed, and patient was put on specific treatment.

Case 18.—Sbordone,[13] 1882. A physician, aged 35, one month previously developed a catarrhal conjunctivitis in the left eye. Examination showed edema of lids; eye was closed. There was abundant lacrimation, with some pain, and considerable chemosis. On the nasal side of the cornea was a cherry-like mass, on which were two areas of ulceration. The margin of these were eroded and ulcerated, being made up of several pits, with the base gelatinous. Near corneal margin was a second ulcer made up from three to eight pits. Preauricular and submaxillary lymph-nodes were enlarged.

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[22] Delow: Cited by Pelissier (Footnote 15).
[23] De Schweinitz: Personal communication.

Case 19.—Hogge,[19] 1894. A woman gave a history of having been kissed on the right eye by a luetic. Examination, O. D.: Inner half of bulbar conjunctiva was red and swollen. There was no secretion; conjunctiva chemotic. Between the cornea and caruncle, the conjunction presented a round hard nodule about 1 mm. in diameter, elevated about 2 mm. above conjunctiva. The border was badly defined, sloping to the level of the normal tissue. Top of nodule was flat and carried a slight oral depression of a paler tint (excoriation). Vision normal. Preauricular, submaxillary and cervical lymph-nodes enlarged. Fifteen days later roseola and headaches appeared.

Case 20.—Sans Blanco,[7] 1901. Woman, aged 22. Right eye showed infiltration and chemosis of bulbar conjunctiva. On the temporal side was an area 1 mm. in extent raised from 2 to 3 mm. This was hard on palpation. On the center of this was an oval ulcer of a leaden-gray color—edges were clean to base, which was flat. No suppuration present. There was no pain on pressure. Cornea was clear, vision normal. Preauricular and submaxillary glands were enlarged. Two months later patient had mucous patches and was given antisyphilitic treatment. A yellowish-gray scar remained. Etiology: Husband had ulcerations of mouth and lips.

Case 21.—Clergerie,[11] 1910. Woman, aged 26. Examination one month after onset of conjunctiva irritation. Right preauricular and submaxillary lymph-nodes swollen. Lids of right eye were edematous, and there was tumefaction of bulbar conjunctiva. Four days later ulceration appeared in inferior temporal portion where chemosis was most prominent. Base of ulcer was covered by granulations. Palpation gave a feeling of induration. There was no pain. Cultures showed presence of yeast. The *Spirochaeta pallida* was found in the secretion. Later a roseola appeared. Etiology: Infection evidently derived from luetic infant. About one month after assuming charge of the child the patient first noted the eye symptoms.

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ABSTRACT OF DISCUSSION

Dr. Arthur J. Bedell, Albany, N. Y.: In connection with Dr. Spratt's paper I should like to speak of an unreported case of initial lesion of the lid and bulbar conjunctiva. E. F. R., aged 25, a coachman, came to my office Nov. 18, 1910, giving a history of first noticing a small red pimple on his left lower eyelid about two weeks before. This was scratched with his finger-nail until it bled. Two days later the sore became more painful and, after the usual home remedies had failed, he applied for help. Ten days previously the left preauricular lymph-node became enlarged and seems to have remained the same size since. The patient had felt no pain or ache except left-sided frontal discomfort for a short time after rising. He denied lues; had had Neisser infection but no other serious illness. He had used tobacco and alcohol excessively. The right eye was negative except for a refractive error. Vision 20/30. The left eye, vision 20/50, showed congestion and swelling of both eyelids, the lower lid was indurated, especially the outer third which surrounded an irregular area of necrosis, 12 by 6 mm., with erosion through skin and conjunctiva destroying the hair follicles. The ulcer had a punched-out appearance, with irregular margin, the base was covered with a grayish-green false membrane, which was easily removed showing a grayish-blue surface which did not bleed freely. There was induration of about 2 cm. Although considerable serum oozed on scraping, the structure remained unchanged. The cornea was clear, the palpebral conjunctiva slightly injected, and the bulbar edematous with full vessels. To the temporal side of the limbus was an irregularly round area 4 by 5 mm., in opposition with the ulcer on the eyelids. The iris was not congested and the inside of the eye presented no abnormality except an oval disk. The left pre-auricular lymph-node was swollen (about 15 mm. in size) and the overlying skin was red and painful. There was no sign of skin lesion. Dr. James F. Rooney made smears of the serum and found *Spirochaeta pallida.* There was steady extension of ulceration, greater swelling of the lid and enlargement of the lymph-node even under mercury ointment. Dec. 11, 1910, five weeks after the first symptom, the patient developed a dark red maculopapular eruption on the back of the hands, a few hours later it appeared on the abdomen, then on the legs, and gradually on the face and body. December 21, he had a definite secondary fever with malaise and depression. The left lower lid was immensely swollen, although the ulcer was cicatrized except at the borders, where bleeding was easily induced. The mass had a more characteristic cartilaginous feel, the ulcer on the bulbar conjunctiva becoming smaller with much less surrounding congestion. The patient had two injections of salvarsan and made a slow but good recovery. It is interesting to give the theory as to his infection. In a stable in which he worked a fellow employee had a secondary palmar syphilid so that it seems possible that the infection could have been transferred to the reins, and later the patient using the same harness could have conveyed the active virus on his fingers to his eyelid and so infected himself.

Dr. Charles N. Spratt, Minneapolis: I have indirectly heard of another case that occurred in San Francisco. That makes only four cases so far reported in the United States. It seems singular that it should be so rare when lues is quite prevalent and people do not always wash their hands.

ARTIFICIAL ILLUMINATION, A FACTOR IN OCULAR DISCOMFORT *

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INTERPRETATION OF OCULAR DISCOMFORT

From the evidence at hand it seems quite certain that ocular discomfort, the result of exposure of the eyes to light, and especially that observed during close work under improper artificial illumination, must be interpreted largely as muscular fatigue of, and pain in, the extra-ocular and intra-ocular muscles, the result of their constant contraction or spasm in attempting to protect the retina from too much light. The question immediately arises: Why should this be brought about by artificial light of a certain intensity when there is no complaint made by possessors of healthy eyes from daylight illumination of several times this intensity? It seems to us to be based to a large extent on the absence of the adaptation of the eyes to a comparatively new condition. By adaptation, in this case, is not meant light and dark adaptation of the retina, but adaptation of the eyes by process of evolution to a new environment.

EVOLUTION OF THE EYE

Evolutionary changes in any organ of the body are brought about by a change in the actual requirements of that organ, the result of different conditions and environment extending over a very long period of time. There was practically no long-continued use of the eyes under artificial illumination before the discovery of the refining process, which produced an efficient artificial illuminant from petroleum about the year 1854.

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* Because of lack of space this article is abbreviated in The Journal. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped addressed envelope.

Since Edison's production of the carbon incandescent lamp in 1878, the number of hours the eyes are used for close work under artificial illumination has been enormously increased. This increased use of the eyes has been made possible by the development of artificial illumination and the improvement made in it. Thus it must be apparent that far from sufficient time has elapsed for evolutionary changes even to begin to adapt the eyes to the tremendously increased use and comparatively abrupt change in environment. The eye, therefore, by process of evolution should still be best adapted to the energy values of the wave-lengths of solar light.

EDRIDGE-GREEN'S THEORY OF VISION

How the visual act is accomplished is not absolutely proved, but the theory advanced by Edridge-Green[1] appeals to us as being the most rational. The hypothesis advanced to account for ocular discomfort from artificial light in this paper will be based on Edridge-Green's theory.

EFFECT OF LIGHT ON VISUAL PURPLE

The result of investigations of the photochemistry of the visual act points to the existence within the retina of an unstable, decomposable photochemical substance, the visual purple, which does not cause nerve excitation as long as it remains unchanged. It has been proved beyond all reasonable doubt that this material is broken up or decomposed by the action of light. Its distribution in the ocular apparatus is in that portion where there is every reason to locate the effects of light excitation, that is, the visual cells. The moment this substance is decomposed by the action of light it gives off products which must be regarded as exciters of vision. The action of light is direct. Protected areas on the retina remain unaffected. The rapidity of bleaching or decomposition of the visual purple depends on the intensity and color of the light. The sensitivity curve of the eye for luminosity at ordinary intensities shows a maximum effect in the yellow and green portion of the spectrum. (See curves a, b and c, Fig. 1). It is a well-known fact that the luminosity curve of the eye varies with the intensity of the light, shifting toward the green with illumination of low intensity and toward the orange and red with illumination of high intensity. (Fig. 1. Curves a, b and c).

Luckiesh[3] has determined that visual acuity, for a reading distance of 33 cm. with monochromatic light, is greatest in the yellow green of the spectrum. Thus, it would seem that the radiant energy which has the greatest decomposing action on the visual substance is productive of the greatest visual efficiency, that is, the yellow green waves.

PROTECTIVE MECHANISM OF THE EYE

Inasmuch as the action of light is direct and the decomposition of the visual purple depends on the intensity of the physical characteristics of the light, the end elements of the optic nerve must have some means of protection from the varying degrees of intensity of illumination to which they are constantly subjected.

The protective mechanism of the eye consists of the brow, the lids, and iris. There are also two protective agents within the retina itself: the pigment epithelial layer of the retina and the visual purple.

impulse is set up which is conveyed to the visual center

When a ray of light enters the eye a centripetal and the motor center of the eye from which centrifugal impulses are sent to the various points of distribution of the motor oculi nerve. Naturally the greater the intensity of the retinal stimulation the greater the intensity of the centripetal and centrifugal impulses.

SPECTRA OF DAYLIGHT AND COMMON ILLUMINANTS

Ives[9], on striking an average of a large number of spectrophotometric measurements on various kinds of daylight, concluded that the color of average daylight "may be accepted as having very nearly the energy distribution of a black body at 5,000° absolute," while the ordinary illuminants, such as the ordinary 16 candle-power carbon incandescent lamp, the tungsten incandescent lamp and the Welsbach gas burner, have the color of an incandescent black body heated to 2,000° C. This means that when giving the same measured illumination, our common illuminants, as compared with daylight, are very deficient in blue light and have an excess of yellow and red light. (Fig. 1, curves 1, 2, 6, 8, and Table 1).

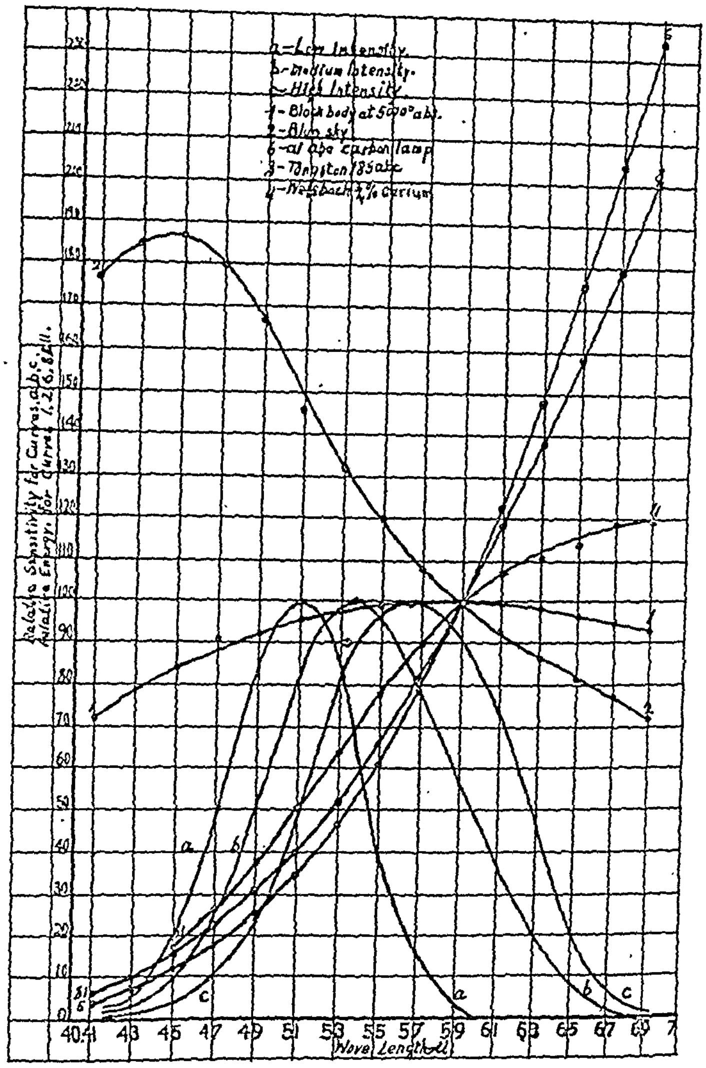

Fig. 1.—Curves showing variations in the sensitivity of the retina as affected by different intensities of light; (*a*) low intensity, (*b*) medium intensity, (*c*) high intensity. 1, 2, 6, 8, 11 are curves showing different energy values by wave lengths from different commercial lighting sources and daylight; (1) black body at 5000° abs; (2) blue sky; (6) 3.1 wpc. carbon lamp; (8) 1.25 wpc. Tungsten lamp; (11) 0.75 per cent. cerium Welsbach.

In comparing these it will be seen at a glance that the wave-lengths from that portion of the spectrum which cause the greatest decomposition of the visual purple

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[1] Edridge-Green, F. W.: Color-Vision and Color-Blindness, Hunterian Lectures, 1911, Lancet, Feb. 4, 1911.

[3] Luckiesh, M.: The Dependence of Visual Acuity on the Wave-Length of Light, Electrical World, 1911, No. 58.

[9] Ives, H. E.: Color Measurements of Illuminants; A Résumé, Tr. Illum. Engin., Soc., 1910, No. 5; Subtractive Productions of Artificial Daylight, Electrical World, 1911, No. 57.

(the greenish yellow waves) are more nearly equal in energy than in any other portion of the spectra. There is in the spectra of artificial illuminants a marked increase in the energy toward the red end and a marked decrease toward the blue end compared with the spectrum of solar light.

HYPOTHESIS AS TO CAUSE OF OCULAR DISCOMFORT

The result is a very marked difference in the quality of the retinal stimulation from artificial illumination compared with that of solar light. *Because sufficient time has not elapsed for evolutionary changes to take place and adapt the eye, the visual apparatus cannot be subjected to this difference in quality of radiant energy for any length of time at proportionately as high intensities with artificial light as with daylight without manifesting ocular discomfort.*

The hypothesis advanced is that with light waves from artificial sources after reaching a certain intensity, which is probably slightly above that which is ordinarily required for general use of the eye, the difference in the spectral quality of artificial light, compared with that of daylight, causes a more rapid decomposing of the visual purple, with consequent increased rapidity in its exhaustion and increased stimulation of the nerve centers controlling the protective mechanism of the eye; there is also a lessened opportunity for reproduction of the visual purple as the intensity of the light source is practically constant. We must not forget also that the eyes are used, especially for close work, a very great many more hours by this generation than the previous one, and the question of ocular fatigue, pure and simple, must be taken into consideration.

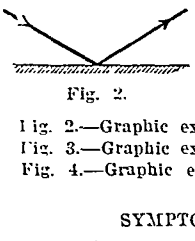
Fig. 2.

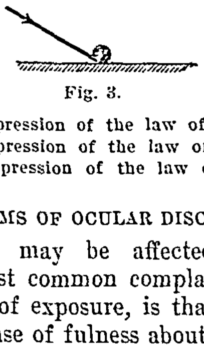
Fig. 3.

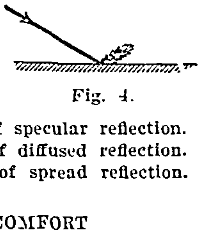
Fig. 4.

Fig. 2.—Graphic expression of the law of specular reflection.
Fig. 3.—Graphic expression of the law of diffused reflection.
Fig. 4.—Graphic expression of the law of spread reflection.

SYMPTOMS OF OCULAR DISCOMFORT

One individual may be affected differently from another. The most common complaint, after a longer or shorter period of exposure, is that the eyes feel hot and dry with a sense of fulness about them. The details of objects looked at become a little blurred, as if the illumination were being diminished. At this stage winking is noticeably increased, as is also the hot, dry feeling and sense of fulness about the eyes. There is an occasional stinging pain causing the lids to be tightly closed for a few seconds. Later, if the effort to use the eyes is persisted in, the finer details of objects are practically lost for an instant and can be brought out only by closing the eyes for a few seconds. There is frequently an actual ache in the eyes and head, mental activity is dulled, and there is an almost complete inability to keep the eyes open, together with marked drowsiness. The eyeballs and lids usually show more or less congestion. A short rest with the eyes closed or shaded will bring about a marked sense of relief, which on resuming the occupation gives place to the same train of symptoms that now make themselves manifest much more quickly. Increasing the intensity of the illumination for a short time will seem to give relief, but it is very quickly followed by greater discomfort.

EFFECT OF INVISIBLE RADIATION

That this effect is not due to the ultraviolet rays is practically proved by the experiments of Parsons,[11] Birch-Hirschfeld, Behr,[12] Fuchs,[5] Schanz and Stockhausen. The cornea and lens absorb practically all the rays of less than 400 microns wave length.

It would seem from the result of recent experiments reported by Vogt[14] that the effect of the ultrared rays must be taken into consideration. The consensus of opinion however is that the harmful effects come from luminous radiations of greater than 400 microns wave length and less than 700 microns. Fuchs says:

> The disagreeable sensation of dazzling by bright light is produced solely by the visible rays of the spectrum and it is these rays that are damaging to the eye in case of affections of the retina and chorioid.

SUPPLEMENTARY FACTORS CAUSING OCULAR DISCOMFORT

Muscular contraction demands an increased blood-supply to the parts and we have a passive hyperemia which in a short time becomes active, the result of muscular spasm. This is manifested as a hot, dry feeling and a sense of fulness or sensation of "sandiness," which is accentuated by the lid rubbing on the eyeball, the result of increased winking. The intensity of the artificial illumination is practically constant and does not vary between such wide limits as does the intensity of daylight, so there is less opportunity for regeneration of the visual purple. After a time the supply of this photochemical substance becomes materially decreased; the decomposing activity of the light remaining the same, the resultant energy of the cone stimulation is diminished because of the exhaustion of the visual purple. The result is a lessened centripetal impulse with consequent lessened centrifugal impulse, a relaxation of the muscular action of the protective mechanism and the already overtired eye is flooded with light. This causes a spasmodic, very active efferent and afferent impulse, which is manifested by a stinging pain, causing the eyes to be tightly closed. After there has been sufficient restoration of the visual purple the eye can again continue its work. With daylight there are continual changes in intensity which tend to produce more restful ocular conditions.

SEVERE AND LASTING INJURIES

There is no doubt that the severe and occasionally lasting injury to eyes exposed to the arcing of high intensity electric currents, and from viewing a solar eclipse, is the result of the action of the intense light on the naked retinal elements. The pupil is caught unawares and neither the lids nor the iris have time to act in protecting the eye. The intensity of the light decomposes the visual purple so rapidly that it leaves the rods and cones unprotected, and, before fresh supply can be rushed to their protection or the pigment epithelium can throw its protective extensions forward between the rods, the damage is done.

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11. Parsons, J. H.: Some Effects of Bright Light on the Eyes. The Journal A. M. A., Dec. 10, 1910, p. 2027.

12. Behr: Alterations and Injuries of Eyes Through Light, Arch. f. Ophth. (Graefe's), 1912, lxxxii, 509.

14. Vogt, A.: Experimental Researches on the Penetrability of the Transparent Media of the Eyes for Ultrared Rays from Artificial Light, Arch. f. Ophth. (Graefe's), 1912, lxxxi, Part 1; Some Measurements on Penetration of Heat Rays in the Human Eye as Well as the Upper Lid, Together with Some Observations on the Biologic Working of Ultrared Light, *ibid.*, 1912, lxxxiii, Part 1.

INSUFFICIENT ILLUMINATION

Insufficient illumination is a factor producing ocular discomfort, especially in work requiring the observation of fine detail. The intensity of the light rays is not great enough to cause a rapid breaking up of the visual purple and consequent cone stimulation. The eyes are brought closer to the object in the effort to see more clearly, which results in an increased effort of the muscles of accommodation and convergence with consequent ocular fatigue. The pupil in weak light dilates to admit a greater amount of light. The accommodative act is accompanied by a contraction of the pupil, and its attempts to dilate under the conditions of illumination and contract under the accommodative effort add to the ocular discomfort.

GLARE AND ITS CAUSES

There is, too, another grave cause of ocular discomfort under illumination by either natural or artificial light, but especially under the latter, on account of its misuse through sources of too high intrinsic brilliancy, too high intensity, or with too little diffusion. This cause is commonly known as "glare" and appears to us in many forms and through many causes.

1. We may, for instance, have glare due to the intrinsic brilliancy of the sun, the Welsbach mantle, of the incandescent lamp filament, or any other form of illuminating unit when the source appears approximately within the line of vision.

2. We may also have glare in a very similar way due to the total light entering the eye from a source whose intrinsic brilliancy is, relative to the source cited above, comparatively low, as for instance, any one of the units mentioned when enclosed in a diffusing ball or situated behind diffusing glass, or from the sky area—blue or overcast—directly in the line of vision, but remote from the sun.

3. We may also have a very objectionable form of glare by reflection from surfaces such as paper from which we read or on which we write, varnished desk tops, lightly tinted walls, glass in picture frames and other similar conditions of every-day occurrence.

REMEDIES FOR OVERCOMING GLARE

The remedies for overcoming the glare due to the first two causes are practically effective and easily available. The ill effects can be minimized, for instance, by enclosing the sources in diffusing mediums which will cut down the intrinsic brilliancy of the unit; by subdividing units for any given intensity of illumination in an installation into small units, enclosed as above; by distributing units more or less uniformly over the area to be illuminated, instead of concentrating them at one point, thus avoiding the possibility of any great number occupying positions within the line of vision at any one time; by placing the units high above the natural line of vision, or concealing the source entirely from view by means of opaque reflecting mediums, as in the indirect system, thereby transferring the phenomenon from the class under discussion to the third class.

GLARE BY REFLECTION

It is desired at this time to call particular attention to glare by reflection. As by far the major portion of our visual functions are performed through the medium of reflected light, this form of light is, from a practical point of view, by far the most important. It is believed that until recently there has been no real appreciation of the magnitude of damage done by reading from pages with highly calendered and glazed surfaces on which printing is done by means of equally brilliant ink. We see the printed page by virtue of reflected light only and this is dependent on the illumination superimposed on its surface and on its reflection characteristics. This will be more apparent on consideration of the principles of reflection.

LAWS OF REFLECTION

Probably the only conception which most individuals have of the phenomenon of reflection is based on the extremely simple and therefore easily remembered law taught for years: "The angle of reflection is equal to the angle of incidence." This law is as true to-day as in years gone by if applied to the surfaces to which we were taught to apply it. Like many other physical laws, it is correct within its limitations, but must be expanded to-day to meet the newly appreciated conditions. The law, as stated above, is perfectly true and accurate when the light impinges on surfaces such as mirrored glass, polished metal or other surfaces approaching the same characteristics—in other words, it applies accurately to *specular reflection* (Fig. 2). A beam of light, under this law, is reflected, minus loss by absorption, in a single direction, depending on the angle at which it strikes the surface.

As our reading surfaces are neither metal nor glass, and yet seeing the page depends on reflected light, it will readily be seen that other types of reflection must exist. If the surface is irregular, or mat, as in the case of blotting-paper, paper with the desirable characteristics discussed in the reference given below, and calcimined ceiling and wall surfaces, the reflected light will, more or less perfectly, obey the law of *diffuse reflection* (Fig. 3), according to which the incident beam will be broken up and diffused, or scattered, in all directions, the maximum rays of reflected light taking a direction perpendicular to the reflecting surface; thus, if the diffusion is perfect, dropping straight down from the ceiling, for instance. The intensity of the rays in any other direction is proportionate to the chords of a circle drawn tangent to the surface at the point of incidence.

Some surfaces, such as mediums which are in their usual state specular in character, but which have been depolished similarly to a ground glass surface, obey a third form of the law of reflection—sometimes called the law of *spread reflection* (Fig. 4), in which there is only a partial diffusion, or scattering, of the incident beam of light the maximum reflection taking place at an angle assigned by the law of specular reflection. The intensity of the reflected rays in any direction may thus be represented approximately by an ellipse, whose axis is in the direction of the angle of specular reflection and which is drawn tangent to the surface at the point of incidence.

The preceding argument is extracted from a more or less complete discussion of this form of glare contained in a paper[15] which was read before the Chicago section of the Illuminating Engineering Society February 22, which, in turn, was prompted by a most thorough and complete development of this subject in a paper by Mr. Arthur J. Sweet.[16]

DAYLIGHT ILLUMINATION

In the discussion up to this point particular stress has been laid on the disadvantageous qualities of artificial illumination and their effects on ocular comfort and fatigue. In our enthusiasm over the pursuit of this phase of the subject, however, we must not lose sight of the fact that daylight also has deleterious characteristics which often produce very uncomfortable and harmful results on the ocular organism.

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[15] Vaughn, F. A., and Black, Nelson M.: Discussion of Ocular Comfort and Its Relation to Glare from Reflecting Surfaces, Electroforce, April, 1913.

[16] Sweet, Arthur J.: Reflecting Mediums, Railway Electric Engineer, January, 1913.

NATURAL ILLUMINATION FAR FROM IDEAL

Daylight has been assumed by many in the past, and by the laity especially, to be the perfect illumination. This idea, it is believed, an unbiased consideration of the subject will dispel. Its principal advantages are its abundance and its cheapness; its color may or may not be an advantage, according to results of future investigations. Its disadvantages are certainly very apparent in its wide variations in intensity and diffusion—far exceeding the limits placed by public service commissions on electric lighting and gas service; its excessive quantity, or overabundance, based on what has been demonstrated to be sufficient artificial illumination; its excessively glaring effects when an attempt is made to utilize it unscreened or undiffused; its undependability on account of weather conditions; its inability to supply us with twenty-four-hour service, which service is demanded of almost every public utility company in this country; and also—for which man alone is to blame—its incorrect application to and utilization in our interiors.

It is, perhaps, rather an egotistical statement, but illuminating engineers to-day believe that they can produce far more perfect illumination than daylight as far as regulation, control of intensity and color, continuity of service and some other features are concerned, and it is believed that they will be able to demonstrate it as time goes on. Therefore it is desired to call attention to the imperfections of daylight illumination and attempt to eradicate, or at least adjust, the idea that daylight is perfect illumination.

It is not deemed necessary to enter into the analysis of the composition of daylight at this time, or to more than call attention to the fact that in "daylight," besides the visible rays, there are rays in the infrared region which present themselves in the form of heat, and in the ultraviolet region, those which have well-recognized chemical powers. These extreme rays are probably not useful in producing vision and therefore, if allowed to enter the eye, may be deleterious in action. It is well known, in fact, that the eye is so constructed as to protect itself, to a marked degree, against their action, and some of the disorders of the ocular mechanism which are the results of exposure to solar light are undoubtedly due to their presence. As Alger[17] says, for instance:

> In snow and desert blindness the light is broken up by reflection from the crystalline snow or sand and the actinic waves produce intense inflammation of the *conjunctiva* which, if long continued, results in total disability. Even in temperate climes one suffers more or less from glare and burn from direct or reflected sunlight.

It will be seen from the preceding discussion, we believe, that it is not by any means an established fact that daylight illumination is ideal and these comments are made for the purpose of calling attention to its imperfections, and to the necessity for scientists and engineers to adjust the conditions surrounding our every-day use of natural light so as to protect the eye, as completely as possible, from its bad effects.

Of course, notwithstanding the above criticism, we must all be very thankful for the abundance and cheapness of the illuminant supplied us by Nature, but should show our appreciation by learning how to utilize it.

The task of illuminating engineers in controverting the idea which is so prevalent, that sunlight is the ideal light, is fully appreciated. It is true also that, as a general proposition, it is our utilization of the daylight in our rooms which is most harmful. It usually comes in from a horizontal direction and therefore, in natural illumination as we generally utilize it, we have decided non-uniformity, insufficient minima and excessive maxima, as well as the undesirable direction of the light, and deep contrasts between the window spaces and dark areas.

INFLUENCE OF DIRECTION OF LIGHT ON OCULAR COMFORT

While speaking of the direction of the light it might be mentioned that the snow and desert blindness are greatly aggravated by the unnatural and upward direction of the light from the ground. For this reason protection is realized by spectacles made of disks of leather with holes partially cut out and bent down so as to intercept the light from below, and by blackening the skin below the eyes to obviate upward reflection of light coming from above. It may therefore be that the bad effects of excessive light, reflected from reading surfaces and desk tops, may be considerably accentuated by its upward direction under certain conditions — the light striking portions of the retina not naturally equipped to receive it harmlessly.

CONCLUSION

In conclusion it might be said that the eye at present, through the process of evolution, is adapted to solar light and can accommodate itself to marked variations in intensity of light of this character with less discomfort than with artificial illumination, because of the quality of the retinal stimulation. There is, however, no reason why ocular discomfort should be any more in evidence with the use of artificial illumination than with solar light, when due consideration is given to the various factors and important conditions bearing on its proper and intelligent application; for, as has also been pointed out, unintelligent and unscientific application of solar light to our every-day needs may and does produce even more harmful results than those often produced by artificial illumination. Beneficial results can certainly be obtained through thorough investigations of the effect of different wave lengths, and amounts of energy on the eye; the adjustment of the color of artificial illumination by selection and design of source; the modification of the effects by selection of color and characteristics of the surroundings; the change in color of reflected light by the color absorption characteristics of paper, ceiling and other surfaces and the practical application of the ultrared and ultraviolet absorption characteristics of glass and other media. The ocular comfort of this and future generations depends on the solution by illuminating engineers of the problems of the proper application of artificial and natural illumination and it is gratifying to note the concordance of ideas and methods of application, and the unanimity of purpose, exemplified by the work of the active members of this profession, in cooperation with physiologists, psychologists and ophthalmologists who are interesting themselves in this subject.

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[17] Alger, Ellice M.: Illumination and Eye-Strain, Tr. Illum. Engin. Soc., 1913.

ABSTRACT OF DISCUSSION

Mr. Herbert E. Ives, Philadelphia: For progress in this line it is essential to have the cooperation of the ophthalmologist and the engineer. Whether this cooperation takes the form of joint action with the Illuminating Engineering Society through joint committees or through the cooperation of individuals, as in the present case, matters little, but the two points of view must both be considered if artificial light is to be rendered free from danger to the public. The Illuminating Engineering Society was founded for the study of the production, measurement and utilization of light. It started out as a body of electrical and gas engineers. Later we have added physicists, architects, ophthalmologists, physiologists and psychologists. What we have accomplished may be described as objective, what we have not, as subjective. We have analyzed light into what we consider its important elements—color, intensity, direction and diffusion. I feel safe in saying that, given the money and a fire-proof laboratory, we can produce any conceivable sort of illumination. We can copy daylight, we can produce light containing no heat-rays, light containing no ultraviolet, light coming from above, from the side and from visible or concealed sources. We are well equipped so far as the physical analysis and synthesis is concerned. When we turn to the subjective side, however, we meet limitations. The eye is the ultimate consumer and we have learned by sheer experience that the greatest engineering efficiency is not the greatest visual efficiency. An engineer would expect the most efficient illumination of a printed page to result from pouring all the available light on it. We find, however, that it is much better to put some of the light on the surroundings, thereby lessening contrast and preventing ocular fatigue. It is then that we need the ophthalmologist. We must know about the eye and we have no means of testing to know whether an illumination is affecting the eye beneficially or detrimentally. Specifically, we need test methods. The classic tests for ocular efficiency are woefully inadequate. Visual acuity, perception of brightness-difference and color-difference perception are altogether too crude. Their indications are not definite enough to distinguish between illumination conditions so extreme that mere inspection would condemn one as acutely uncomfortable and commend the other as admirable. We look to the psychologist and the ophthalmologist for new and scientific means of determining when the eye is abused. Reciprocally, the light specialist can be of assistance in this work to the ophthalmologist. He can insure that the various physical factors are viewed in their right proportions. He can keep the ophthalmologist from "barking up the wrong tree." For instance, he can, from his physical analysis of light, point out that there is no significance to a discussion of the relative comfort to the eyes of oil, gas, electricity or daylight. The manner of production of light is a mere accident. The real factors are intensity of illumination, color of light, the intrinsic brilliancy of the visible bright surfaces (of light source or illuminated object) and the direction and diffusion of the light. The much-lauded student-lamp can be exactly copied by gas or electricity. It is a light source of rather low intrinsic brilliancy, of yellow color, concealed from the eye and so made that it must practically be used as a side-light source. If it has great merit, it is entirely in these copiable factors, not in its fuel. The lighting expert can also inform the ophthalmologist that the ultraviolet light in ordinary light sources is far less by actual measurement than in a corresponding amount of innocuous daylight. He can point out that practically all artificial light sources have an enormous excess over daylight of infra-red, or heat-radiation and that here is the logical point of study, rather than the greatly advertised ultraviolet. Perhaps the greatest pitfall for the non-engineering student of lighting is the common confusion between illumination and intrinsic brilliancy. Do not confuse a bright light with a high illumination; they may or may not go together. A tungsten filament of 1,000 candle power per square inch gives as bright an illumination on the table if an eye shade is worn but the difference in comfort between seeing the filament and not is enormous. Perhaps I can make more clear the present state of illuminating engineering and its needs by an illustration of the only method of test we have for visual efficiency. This is what lawyers call the case system. If we find an illumination system that looks good we analyze and copy it. The danger is that we will copy a lot of non-essentials. Why, it will be asked, do we not then simply copy pleasant daylight illumination from windows, proved good by experience? When daylight from windows is analyzed it is found to be illumination chiefly from a large area low intrinsic brightness concealed light source (the sky) entering at the side and producing a range of visible brightness of about 200 to 1. By night we light the same room by a small visible, high brightness source from above, 95 per cent. of it heat-radiation, producing a range of visible brightness of 100,000,000 to 1. I have recently calculated that accurately to copy daylight in a room, thereby changing in this radical manner the method of artificial lighting, would involve spending more for the lighting of one room in a night than the rent of the whole house for a week. The illuminating problem is, therefore, one of the conservation of natural resources as well as the conservation of vision. It is necessary to know what the eye must have for health and what it can dispense with. Only by the cooperation of the ophthalmologist and the engineer can this be brought about.

SOME COMPARATIVE MEASUREMENTS OF THE SKULL AND SELLA TURCICA

WITH REPORT OF EIGHT CASES *

JOHN B. POTTS, M.D.

OMAHA

For many years ophthalmologists have observed ocular affections which were caused by disturbance of the pituitary body. These had been reported and correlated so that a set of rather definite ocular symptoms had been established, but owing to the inaccessibility of the gland little progress had been made in alleviation of the trouble. It remained for Erdhein, Oliver, Schafer, Herring, Fröhlich, Borchardt, Goetsch, Cushing, Jacobson, and others to determine the anatomy, physiology, pathology and symptoms so that a fair understanding of the function of the gland and its disorders was obtained. In view of the intimate relation between the pituitary body and the optic nerve, it seems probable that a large number of these cases will be first seen by the ophthalmologist in the future, as they have been in the past. The subject is only in its infancy, and I think that there are many important points in diagnosis which as yet we have only surmised.

SYMPTOMS

It is impossible for me, in this paper, to do more than mention some of the more prominent symptoms, and for more detailed information on the subject I would refer you to Cushing's book.[1] Three general types are recognized:

1. Hypopituitarism, of Fröhlich's type, due to a lack of development or secretion; the pituitary body either remains small or its secretion inadequate. Hence we have persistence of infantile skeletal growth, adiposity, absence of hair, sexual infantilism. This is pretty well recognized and is not of the type that causes disturbance of the optic nerve.

2. Typus Launois. Acromegalia, hyperpituitarism during adolescence, with symmetrical increase in the skeletal growth, so-called giantism.

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* Because of lack of space, this article is abbreviated in The Journal. The complete article appears in the Transactions of the Section and in the author's reprints.

[1] Cushing, Harvey: The Pituitary Body and Its Disorders, Philadelphia, Lippincott, 1912.

3. Typus Marie. Hyperpituitarism in adult life resulting in enlargement of the bones of the head and face, and lengthening of the bones of the extremities.

It is the third class that we most frequently meet in our work, that is, cases in which there is an enlargement of the gland and the patient consults us for headache, disturbance of vision, muscular paresis of the eye, exophthalmos, etc. Subjective symptoms are headaches, lassitude, inability to fix attention, loss of memory, anosia, slimy discharge from the nasopharynx, constipation, etc.

Skeletal Symptoms.—In the early stages there may be an increased muscular strength, later this is followed by a diminution of strength, which often becomes very extreme.

Sexual Symptoms.—In the early stages there may be a libido sexualis followed by impotence in the male, and cessation of menses in the female. Other symptoms of lack of glandular activity are increased carbohydrate tolerance, adiposity, polyuria, dry skin, which may be rough or scaly, lack of perspiration, loss of hair, especially on the body.

Eye Symptoms.—Recurrent periods of temporary blurring of the vision with a gradual loss of sight. The fundus usually appears normal except for primary atrophy of the optic nerve, although in some cases there may be swelling and edema of the nerve-head and hemorrhages into the retina. The fields are often very characteristic, although there may be many variations due to the fact that the tumor does not enlarge symmetrically. The typical fields are a bitemporal hemianopsia which first appears in the upper outer quadrant. The fields for color are generally affected before those for white.

Roentgen-Ray Findings.—Normally the sella turcica is very clearly outlined; clinoid process above and anterior, sphenoid cells anterior and below, and the body and the posterior clinoid process below and posterior. If the enlargement of the gland is only moderate we may see the sella with its walls much distended, but the different anterior structures still present. If the extension is anterior, the clinoid processes are gone. If downward, the floor of the sphenoid is forced into the sphenoid cells, and if backward the posterior clinoid process is obliterated. If the growth has become sufficiently large all these conditions may be present, and it is impossible to see any of the normal outlines of the sella.

In order to have a clear understanding of the pathologic changes that have taken place in the skeletal outlines it is necessary to have a well-established idea as to the normal conditions. For the past four years we have been using the Roentgen ray to localize foreign bodies and suspected foreign bodies in the eye. These patients had no symptoms of pituitary trouble, and the age varied from 4 to 60 years; hence a comparison of these plates should give us a fairly accurate idea as to the Roentgen-ray picture presented by a normal sella turcica. In addition to this I have found twenty-nine plates in which it was possible to secure the measurements from the anterior clinoid processes anterior to the inner table of the frontal bone, also the perpendicular measurements from the anterior clinoid processes to the inner table of the dome of the skull. An analysis of these tables shows that the normal pituitary body varies from 8 mm. anterior-posterior to 13 mm., and from 6 mm. in depth to 10 mm. While a measurement greater than this may not be pathologic, it seems to me that it should be looked on with suspicision. A glance at the table of the measurements of the skull shows at once a marked uniformity, in contrast to the measurements of those of the pituitary body, and it seems to establish conclusively that there is no apparent relation between the size of the latter and the former. Another striking point is that, in contradistinction to the frontal sinuses and sphenoids, the sella turcica reaches a size nearly equal to that of an adult at an early age, and, as will be clearly shown in the illustrations to follow, there seems to be no relation as to size between the different sinuses and the sella turcica. These observations emphasize the fact that the pituitary gland is, like the brain, of vital importance to the development of the body, and the skeletal growth makes an early provision for its proper housing.

REPORTS OF CASES

I wish now to report the following cases, seen jointly by Dr. Gifford and myself:

CASE 1.—J. F. McD., aged 26, came to us Sept. 10, 1912, on account of slight failing in right eye; no headache, dizziness or nausea. He had had the ordinary diseases of childhood, but had been otherwise healthy. About one week before consulting us he noticed that he did not see well in the right eye. When questioned he admitted that he had been growing for three or four years, and his height had increased from one to two inches.

Inspection: Man of unusually robust appearance, height 6 feet 1 inch, weight 180. Well muscled and had been, up to this time, of unusual strength. Hands and feet noticeably large. Hirsuties normal; no enlargement of other ductless glands. Vision, right eye 20/200, left eye 20/20, not improved by glasses. Ophthalmoscope: Fundus normal, temporal fields somewhat constricted. Nose thin; serous discharge over posterior part of left middle turbinate and nasopharynx.

TABLE 1.—MEASUREMENTS OF THE SKULL AND PITUITARY BODY IN TWENTY-NINE CASES OF NORMAL HEADS*

	Measurements Skull A. P. cm.	Measurements Skull P. cm.	Measurements Sella turcica A. P. mm.	Measurements Sella turcica D. mm.		Measurements Skull A. P. cm.	Measurements Skull P. cm.	Measurements Sella turcica A. P. mm.	Measurements Sella turcica D. mm.
1.	6	10	10	10	16.	6.25	10.25	11	9
2.	6	9.5	12	8	17.	5.5	9.5	10	5
3.	6	10.5	11	7	18.	6	9.25	10	9
4.	5.5	9.5	10	6	19.	6.5	9.5	10	6
5.	5.5	9.25	12	9	20.	6.5	10	11	7
6.	6.5	10.25	13	10	21.	6.5	10.5	10	8.5
7.	6.25	10.25	12	10	22.	6	10.5	12	10
8.	6	9.5	12	8	23.	6.75	10	10	8
9.	5.5	9.5	12	7	24.	8	10.5	10	8
10.	6.5	11	11	9	25.	5.75	10	12	10
11.	6.25	11	14	10	26.	5.5	9.25	8	10.5
12.	6.75	9.75	12	8	27.	6	9.5	10	8
13.	7	11	12	8	28.	6	10.5	11	6
14.	5.75	9.25	10	6.5	29.	6.5	9.5	10	8
15.	6.5	9.75	12	9					

*In this and the following tables, under "skull," "A. P." refers to the measurements from the anterior wall of the sella turcica to the internal table, at a point opposite the frontal prominence. "P." stands for a measurement from the anterior clinoid process perpendicular to the inner table of the skull. Under "sella turcica" "A. P." refers to the anterior-posterior measurements of the sella, and "D." to the depth of the sella turcica. From a careful examination of the table it will appear that there is no definite relation between the measurements of the skull and the pituitary body.

Sept. 19, 1912: Sent to hospital, under treatment of rest and salicylate. Vision of right eye returned to 20/20 minus 2. Sent home.

Oct. 22, 1912: Reported for inspection; vision, right eye 20/40, left eye 20/15. Ophthalmoscope: Right disk a little pale. Sent home with letter to doctor and instructions to take potassium iodid, 20 grains, three times a day.

Nov. 3, 1912: Returned; condition decidedly worse, vision right eye 20/30, left eye 20/20. Ophthalmoscope: Right disk slightly paler than left; fields becoming more constricted. Headache and peculiar full feeling in head accompanied by slight dizziness and some nausea. Gait becoming noticeably ataxic and patient complains of great loss of strength; knee-jerks lessened. Carbohydrate index not noticeably increased, no glycosuria or polyuria. Roentgen ray shows a large sella turcica, anterior posterior 15 mm., depth 10 mm. Skull anterior measurements 6.25 cm., perpendicular measurements 9.5 cm. Bones of forearm and leg and phalanges decidedly lengthened, and characteristic epiphyseal changes, described by Cushing and others.

Diagnosis: This I consider to be a typical case of acromegalia coming on during adult life. I was not able to secure any photographs and hence could make no comparison as to any change in features, but the lips had not become thick and, except for a possible slight exophthalmos of the right eye, patient said that there was no noticeable change in his appearance. He refused operation and passed out of our hands; we have not seen him since.

Case 2.—D. M., aged 40, Dec. 30, 1912, consulted us because she noticed vision failing and on account of severe temporal headaches. She had been a healthy child and had no serious illness until ten years ago she had a nervous breakdown in the fall following mother's death and financial reverses. In the following spring she says she was treated for rheumatism. About this time she began to have headaches, some dizzy spells, serious vomiting spells and terrific temporal headaches; she felt exhausted and had no ambition to do any work. She has not menstruated since trouble began ten years ago, at age of 30. About the same time she noticed that she was gaining in flesh and has kept on gaining in weight until about two years ago. Since then she has been feeling somewhat better and has not gained in weight until this spring.

Mother died ten years ago, tumor of the stomach, aged 67. Father died aged 44, cancer of the stomach; patient had two brothers, one living older than sister, normal; the other died of typhoid fever.

Inspection: Rather a comely woman, intelligent and refined face, height 5 feet 8 inches, weight 170, no enlargement of head, hands or feet, skin dry and smooth.

I was not able to obtain carbohydrate tolerance.[2]

Vision: Right eye 20/70, left eye 20/200; glasses do not help. Ophthalmoscope: Right eye nerve-head a little pale, left eye outer half pale and excavated. Fields, left eye typical temporal hemianopsia, right eye temporal fields not so much restricted as left. Nose normal. Roentgen ray: Outlines of sella entirely obliterated, floor occupying most of sphenoid cells, anterior-posterior diameter 26 mm., depth 16 mm.

TABLE 2.—MEASUREMENTS OF THE SKULL AND PITUITARY BODY IN WHICH THERE WAS SOME INVOLVEMENT OF THE PITUITARY GLAND

	Measurements Skull		Measurements Sella turcica			Measurements Skull		Measurements Sella turcica	
	A. P. cm.	P. cm.	A. P. mm.	D. mm.		A. P. cm.	P. cm.	A. P. mm.	D. mm.
1.	7	.....	18	16	7.	5.5	10.25	14	10
2.	5.25	.....	26	16	8.	6.25	9.5	15	10
3.	6	.....	..	9	9.	6	.....	15	10
4.	5.25	9.25	(gone)		10.	6	11	15	10
5.	6.5	.....	10	7	11.	6	9.5	9	16
6.	6.5	10	13	10					

Diagnosis.—Strumous enlargement of the pituitary gland with deficiency of secretion of posterior lobe.

Operation was advised, but patient had planned a trip to the West and insisted on making this before having anything done. I saw her only once and have no report since.

Case 3.—E. C. O., aged 46, consulted us Feb. 21, 1912. His sight had been failing for some time past; he had had headaches in temples and dome of head for past eight or ten years. "Says he has catarrh. Chronic, persistent constipation. Has not perspired for several years. Hair (face, head and body) very scanty; formerly had heavy beard. Is very fond of sweets, and carries candy around in his pocket much of the time. Small-boned and says he was slim until about ten years ago, when he began to put on flesh. Now quite heavy with pendulous abdomen. Family history negative. Mentality, answers readily but mental faculties seem to work slowly. Says he is inclined to sleep more than formerly and often feels drowsy during the day."

Inspection: Extremities, hands and feet, not enlarged. Head large, has increased one or two sizes since he was 25. Eyes prominent, right slightly more so than left. Reflexes normal. Carbohydrate tolerance very high, over 300 grams of glucose. Skin dry and smooth, yellowish not clear, but no brown spots. Thyroids not enlarged.

Vision: Right eye 20/50, left eye 20/40, with correction right eye 20/40 minus 1, left eye 20/20. Ophthalmoscope: About normal, possibly nerve-head a trifle pale in outer quadrant of each eye. Fields much constricted, not bitemporal, relative central scotoma.

Nose: Ethmoiditis on both sides. Operation, resection of anterior tip of both middle turbinates and exenteration of posterior ethmoid cells.

Treatment, sodium salicylate and rest. Noticed slimy discharge from nasopharynx from time to time after the operation. Headaches much better. Vision improved to 20/20 minus 4 in right eye, and fields for white were about normal.

While under treatment an ulcer developed on the left eye which reduced its vision to 20/200. Patient was sent home.

May 11, 1912: Patient returned with vision 20/30 in right eye, 20/200 in left. He still had considerable headache, fields about same; considerable discharge from left ethmoid region.

Aug. 26, 1912: Vision right eye 20/30, left eye 20/50, fields constricted but not so bad as when first seen. Discharge from left ethmoid region and continued headaches. Resected remainder of left middle turbinate and ethmoid cells, and removed anterior wall of left sphenoid.

Sept. 12, 1912: Vision right eye 20/20 minus 1, left eye 20/50, fields for white normal, no headache, no discharge from ethmoids. Slimy discharge from posterior pharynx at times, and head always feels much clearer and better after such a discharge.

Feb. 16, 1913: Vision right eye 20/20 minus 1, left eye 20/70. Ophthalmoscope: Normal, temporal fields about normal.

TABLE 3.—MEASUREMENTS OF FORTY-ONE NORMAL SELLAE TURCICAE*

	A. P. mm.	D. mm.		A. P. mm.	D. mm.
1.	10	8	22.	9	7
2.	13	9	23	10.5	6
3.	9.5	6	24.	11	8
4.	10	8	25.	10.5	8
5.	10	6	26.	12	8
6.	11	7	27.	11	8
7.	10	8.5	28.	10	8
8.	10	8	29.	12	9
9.	10	8	30.	13	9
10.	10	8	31.	12	8
11.	12	10	32.	8	10.5
12.	10.5	7	33.	11	8
13.	12.5	7	34.	10	8
14.	16	10	35.	11	6
15.	11	8	36.	10	8
16.	10	8	37.	10	6
17.	12	6.5	38.	12	7
18.	11	7	39.	11	9
19.	10	7	40.	10	5
20.	11	8	41.	10	9
21.	10	8			

*Taken from persons examined by Roentgen ray for foreign body or other accident, in which there is no history of headache or other trouble which might point to any disorder of the pituitary gland. This table shows that the great majority of normal sellae turcicae vary within quite definite limits, the average being A. P. 10.8, D. 7.7. In this table No. 14 shows an abnormally large sella. I have no history to show whether the patient had any symptoms of disturbance of the pituitary gland.

This case presents many typical symptoms of pituitary trouble in which there is a deficiency in the posterior lobe secretion. The slimy discharge patient speaks of with the improvement in his vision and cessation of headaches, following the drainage of the sphenoid cells, would seem to point to a probable cystic degeneration of the gland, with drainage through the sphenoid. So long as his vision is not affected and he is not suffering from headaches, I have not advised him to seek an operation, but he understands his condition and I have advised him that if he notices a diminution of his vision or a return of the headaches, an operation will probably be necessary.

The above cases fall in Cushing's classification, Group I, "Cases of dyspituitarism in which not only the signs indicating distortion of neighboring structures but also the symptoms betraying the effects of altered glandular activity are outspoken."

Case 4.—I present this case to call attention to the changes that may occur in the sella turcica due to pressure from tumors located at a distance.

C. L., aged 20, Dec. 19, 1912, consulted us in regard to loss of vision and headache. Father and mother living; several brothers and sisters, all well. Medium size, appearing younger than he is. Healthy until the present illness.

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[2] Since sending in paper I saw patient and carbohydrate tolerance was over 300 gm. glucose.

He first noticed trouble October, 1912, after wrestling match, in which he became very warm. Next day he had severe frontal headache, dizziness, nausea and vomiting; he was sick about a week and then gradually improved. At this time he had pain in right eye and says there was a tendency for his eyes to become crossed. Sight was somewhat blurred. He had pain in head accompanied with dizziness and nausea from time to time, but was not especially sick until about two weeks previous to present visit. At that time ran after cattle and became very much heated; this was followed by vomiting spells and he was unconscious for some hours. There was no constipation, polyuria, or increased appetite for sweets.

Inspection: Medium size, head somewhat larger than normal, hair on face and body scanty, well nourished but not fat. No enlargement of bones of hands or feet, other ductless glands not enlarged.

Vision: Right eye 10/200, left eye 20/40. Ophthalmoscope: Marked papillo-edema in each eye, perhaps a little worse in right eye. Pupils normal, possibly slight exophthalmos, inclined to fall to the right, knee-jerk gone. Fields, homonymous hemianopsia.

Roentgen ray showed walls of sella turcica largely obliterated, and pituitary body much increased in size. A diagnosis of probable pituitary tumor was made, decompression operation suggested, but not accepted. Patient went home.

TABLE 4.—MEASUREMENTS OF TWENTY SELLAE TURCICAE OF HEADS WHICH WERE ROENTGEN-RAYED FOR DIAGNOSTIC PURPOSES IN PEOPLE COMPLAINING OF HEADACHES, NOT INCLUDING THOSE IN TABLE 2*

	A. P. mm.	D. mm.		A. P. mm.	D. mm.
1.	10	10	11.	12	10
2.	12	8	12.	12	8
3.	11	11.5	13.	11	8.5
4.	13	12	14.	12	7
5.	11	8	15.	11	9
6.	12	7	16.	14	10
7.	11	7	17.	12	8
8.	12	9	18.	12	8
9.	13	10	19.	10	6.5
10.	15	9	20.	12	9

*This table varies but little from Table 3. A. P. measurements 11.9, D. 8.7. No. 10 was a case of specific meningitis with no evidence of pituitary disorder. No. 9 was a case of severe temporal headaches, associated with marked diminution of vision (vision 10/200 in each eye); fields for white not restricted, central scotoma, no evidence of pituitary disorder, sphenoid cells very large, Wassermann negative, tuberculin negative. Diagnosis made of probable auto-intoxication. No. 8 is a colored woman. No. 11 has suffered for the past ten or twelve years with very severe bursting headaches. Nos. 1, 2, 5, 16 and 20 have been subject for a number of years to very severe headaches without apparent cause.

When next heard from, February, 1913, he had entirely lost his sight and father was very anxious to have something done. Dr. Gifford advised them to see Dr. Cushing, who made a diagnosis of a tumor of the posterior cerebral lobe on the right side, and accounted for the changes in the pituitary region as probably caused by intracranial pressure. As the boy had been entirely blind for some time and there was practically no hope of restoring his sight, the father again refused operation.

Case 5.—L. E. B., aged 53, March 22, 1913, complains that sight is poor; he can see straight ahead but not on either side. He was subject to severe headaches, beginning when about 24 or 25 years old, and lasting until five years ago. At that time he had a very serious illness, with severe pain in the head; he became unconscious and remained so for fifty-two hours; was paralyzed on both sides, left side complete and right side partial. He says that both arms and legs were paralyzed; he had to be fed, was blind for several days. He gradually recovered some sight and was able to walk in about two months. Physical condition gradually improved until he felt about as well as ever. He says he has had no headache for last five years.

Inspection: Man of medium height and build; slight drag to left limb. Not fond of sweets; no polyuria or glycosuria. Hirsuties about normal. Right knee-jerk normal, left very slight. July 28, 1910: Vision, 20/20 minus 1 in right eye, 20/30 minus 1 in left eye. Pupil moderately dilated. Ophthalmoscope: Nerves a little pale, fields 20 degrees in diameter.

March 22, 1913: Vision right eye 20/20, and left eye 20/20. Pupillary reflexes a little slow. Ophthalmoscope, nerves somewhat pale, fields as shown in Figure 6. Roentgen ray: Normal outlines of sella entirely obliterated, floor forced down into sphenoid cells. No changes in long bones or phalanges.

The striking points of this case are the fact that the patient had terrific headaches, which nothing would relieve for years, and following an attack of paralysis, during which time he was blind for several days, the headaches have entirely ceased. Central vision returned to almost normal, and with the exception of a slight drag to the left leg, he seems to have recovered entirely from his paresis. Health is good and he is going about his business. There are no indications of pituitary trouble other than the roentgenogram and the eye-findings. If the condition that caused the destruction of the sella was a distal tumor there is no sign of its location at the present time. The question arises if the patient has not had enlargement of the pituitary gland, which, though it has destroyed the normal outlines of the sella, still continues to have a sufficient amount of active gland for the normal functions of the body. I am indebted to Dr. Mick for discovering the disturbance of the sella turcica. When seen by us in 1910, three years after the attack of paralysis, the pituitary body was not suspected.

Case 6.—Dr. R. D. H., aged 61, examined by my colleague, Dr. Gifford, Nov. 1, 1909. Vision: Right eye, hand movements at 18 inches, left eye light perception. Pupils react to light. Tension normal. Ophthalmoscope: Nerve-heads white. Diagnosis, atrophy. At this time nothing especially abnormal was noticed about patient, except for primary optic atrophy.

TABLE 5.—SKULL AND PITUITARY MEASUREMENTS OF FOUR CHILDREN, WITH THEIR AGES*

	Years	A. P. cm.	D. cm.	A. P. mm.	D. mm.
1.	12	6.25	9.5	7	10
2.	6	5.25	10	8	6
3.	4	5.5	10	7.5	5
4.	15	...	..	10.5	7

*In this table by leaving out the fourth case, aged 15, the measurements are A. P. 7.8, and D. 7. The average of the four is A. P. 8.5, D. 7.

Some months ago Dr. Mick, whom patient interviewed as to the possibility of electrical treatment benefiting the vision, took a roentgenogram of his head, and found the outlines of the sella turcica entirely lacking. Dr. Mick then referred the patient to me for ophthalmic examination.

Vision: At this time, right eye hand movements at 18 inches, left eye, no light perception. Ophthalmoscope: Optic nerves atrophic, and vessels small.

I was not able to ascertain from history more than that he had been subject to headaches at the time his vision began to fail. He is mentally bright except at times he complains of a decreased secretion of urine accompanied by headaches and stupidity. He is of medium height, moderately adipose, abdomen not pendulous; hirsuties normal. I was not able to obtain carbohydrate tolerance; otherwise condition was normal for a man of 65. The amount of adipose could easily be accounted for by his lack of exercise, owing to his defective vision.

Case 7.—Miss C., aged 40, was seen by my colleague, Dr. Gifford, at an out-of-town sanatorium about Feb. 15, 1913. At this time patient was blind and showed a choked disk in each eye.

March 17, 1913: Patient was brought to office for examination. Condition of eyes was unchanged. She had had severe headaches for some months past, with a rapid loss of sight about February 1, at which time she suffered greatly from headaches and was unable to be around. For past month her physical condition has improved so that she is now able to be about the house. She has no signs of pituitary trouble, except as shown by the Roentgen ray. Thorough examination by a competent neurologist failed to reveal any evidence of other intracranial tumor. Examination by internist was equally fruitless. The roentgenogram showed the pituitary body to be very much enlarged. The peculiar thing about this plate is that the anterior horns are not disturbed, while the posterior process of the sella is almost entirely obliterated. This probably accounts for the papillo-edema of the optic nerve, which is due to intracranial pressure rather than direct pressure on the nerve by the tumor.

These three cases will fall in Group II of Cushing's, "cases in which the neighborhood manifestations are pronounced but the glandular symptoms are absent or inconspicuous."

To ophthalmologists this should emphasize the importance of having a roentgenogram taken in all cases showing a primary optic atrophy or papilloedema, unless there is some well-established cause for the trouble; as otherwise its true source might not be suspected. They also serve to substantiate Cushing's contention that if these patients can be seen early and an operation done to save their sight they may continue to enjoy comparatively good health for a number of years to come; as by reference to Cases 5 and 6 it will be seen that the loss of the vision dates back several years, and that but for the loss of their sight the patients would be having about normal health to-day. If the enlargement of the gland is not a malignant degeneration, but a hypertrophy or degeneration such as is seen in the thyroid, the pressure symptoms are the only ones causing trouble.

Case 8.—N. J., aged 13, was referred to us Nov. 21, 1912, by Dr. Anderson for ophthalmic examination, with a diagnosis of polyglandular syndrome as in Group V by Cushing's classification. Patient was undersized for age, markedly adipose, bones small, mentally decidedly below normal, tapering fingers, Fröhlich's type, some evidence of thyroid deficiency, no pigmentation from adrenals. Thyroid gland had been administered for some months previous without much effect. At the time of writing this paper patient had lost 3 pounds after one week's administration of whole pituitary gland. Roentgen ray showed the sella turcica apparently normal, except that it was decidedly large for a child of this age. The anterior-posterior measurement of the sella turcica was 14 mm. and the depth 10 mm. The shadow from the pituitary gland seemed to indicate that it was more dense than normal.

Case 9.—Mrs. T. B. P., aged 38, came in Nov. 12, 1912, complaining of pain and swelling over right frontal sinus. Father and mother were rather above the average in size, healthy. Patient had had no sickness in childhood or adolescence; had had severe temporal headaches at times for the last eight or ten years; present trouble for about six months. She had perineal operation with removal of portion of right ovary while under observation; it was then found that she had a double uterus, infantile type.

Inspection: Large well-nourished woman, height 5 feet 9 inches, weight 180, no enlargement of hands, feet or head. Skin normal. Hirsuties normal, no enlargement of other ductless glands demonstrable, no increased appetite for sugar, carbohydrate index, or polyuria. Patient never pregnant; menstrual periods regular for the past eight years. Right frontal sinus tender, transillumination right frontal sinus dark; otherwise normal. Roentgen ray: right frontal sinus decidedly blurred, measurements sella turcica, anterior-posterior 15 mm., depth 10 mm. Anterior clinoid processes gone. Vision normal, ophthalmoscope normal, no history of blurring of vision. Pupillary reflexes normal. Operation, resection of anterior tip of right middle turbinate, and probe passed into right frontal sinus. Relief of frontal pain, but some headache still continues.

I present this case as showing a peculiar condition in which, associated with a very severe temporal headache, the anterior clinoid processes are absent. There are no other pronounced symptoms of disturbance of the pituitary body, and yet I cannot but feel that there is a direct relationship between the severe headache, without any other apparent cause, and the enlargement of the pituitary body with loss of the anterior horns of the sella turcica. In the entire series of normal heads which I have reviewed these are the only ones showing the absence of the anterior horns. I shall make a strenuous effort to keep in touch with these cases, as it will be interesting to note if they later develop decided evidence of pituitary disturbance.

In conclusion, an important point to be remembered in connection with the enlargement of this gland is that it should not be classed with the other tumors within the cranial cavity, but with the hyperplasias or degenerations similar to those which we recognize in the thyroid. For while it may undergo malignant degeneration, its enlargement is much more liable to be a hyperplasia, or a cystic degeneration.

Considering it, then, as we would the thyroid, a true gland, we are not surprised that it so frequently becomes enlarged, and were it not for its peculiar location, a variation in its size would be of much less serious consequences. But owing to this we have not only to consider the effects of its deranged glandular activity, but also the effects of pressure on the adjacent structures. Considering it in this light we find it gives us a much more hopeful outlook, for at any time it may cease its enlargement, as has been noted.

Again, by surgical aid we may relieve pressure symptoms and allow for some further enlargement; or should there be a cystic degeneration this may be drained. Then by supplying, if necessary artificially, deficiency of secretion by feeding appropriate doses of the gland, the patient's life may be indefinitely prolonged, his pain relieved, and often the full use of his faculties retained. In order that this may be done it is necessary that these cases be recognized early, else irreparable harm may be done and modern science be robbed of its victory.

ABSTRACT OF DISCUSSION

Dr. W. H. Mick, Omaha, Neb.: The largest sella in an otherwise normal man measured 17 mm. anterior-posterior and 11 mm. in depth. So no absolute size can be laid down for the sella or the pituitary body. The size of the sella is, however, more closely confined to certain dimensions than the accessory sinuses or the bony parts generally about the head. When portions of the bony wall are absorbed we may look for a pathologic condition somewhere in the brain, which need not, however, necessarily be located in the pituitary body. A glioma in the brain has nearly the same density that the brain has and may not be easily read on a radiographic plate. Thinning of the skull-walls may not be noticeable early in a very rapidly growing brain tumor. In a number of extreme cases the first evidence of intracranial pressure, recognized radiographically, was a disturbance of the bony outline of the sella. On the other hand, careful radiographic study has shown that infection of the sphenoid and ethmoid cells has caused increased density of the pituitary disease, and that when corrected the density and also the other disturbances, including vision, were improved. It is well worth emphasizing that the clinoid processes forming the anterior roof of the sella are absent in a certain number of cases in which no other pathologic condition is located radiographically. In these cases chronic headache has been one of the complaints. The reason for such headache I cannot give and I trust that someone may be able to enlighten us regarding its cause. Two cases shown with this paper were advanced cases of optic atrophy, the patients having no symptoms of pituitary disease; still the entire sella in both cases was destroyed. This fact led me to investigate changes in early cases of optic atrophy, which were found, without exception, within the limits of normal measurements, etc. The post-mortem examination on Mr. C. L., showing the pituitary body normal and the destruction of the sella complete with an abnormally dense shadow back of it, shows how readily compressed tissues cause an increased density in the Roentgen shadows and even destruction of the walls, which easily explains the pressure on the optic tract. No two of the cases of syphilis in which we found changes in the sella were alike. So radiographically speaking one could not differentiate syphilis infection of the head from changes in the sella. We can, however, suspect syphilis as the cause of these changes in the sella from the fact that the skull-wall is markedly thickened, is irregular in density and, last but not least, by the presence of stellate bodies located in the bony structures.

When changes take place in the pituitary body they are recognized early radiographically, either by a loss of the upper portion of the bony wall or an increase in the size of the sella, or by crowding the sella down in the sphenoidal sinuses. It must not be forgotten, however, that the sella is sometimes found crowded in the sphenoidal sinuses and still normal in dimensions from other causes than pituitary disease. It is needless to mention that in a case of pituitary disease bony changes are recognized elsewhere in the body radiographically. Our study has clearly demonstrated that changes elsewhere in the skull cause changes in the sella turcica and the careful study of Mr. C. L. would convince us that pressure changes destroying the sella, with pressure on the pituitary body may cause an overdevelopment of the maxillary bone and in this case the teeth are usually clear and dense to Roentgen penetration, which is unusual and which I really would not be able to explain in any other way.

Dr. John B. Potts, Omaha: One thing has not been brought out by the different neurologists, and that is that an inflammation of the sphenoid cell may have some effect on the pituitary body as well as on the optic nerve. I have two cases that bear somewhat on this. In one I showed the radiograph. The other is that of a woman who never had any symptoms of pituitary trouble, but had retrobulbar neuritis, during the course of which she developed incipient diabetes, with the passing of an immense amount of water, which has continued even though the nasal and ocular symptoms have cleared up. Dr. Cushing in going over the same thing in operating on dogs found that the increased flow of urine began three days or more after the operations.

SECTION ON LARYNGOLOGY, OTOLOGY AND RHINOLOGY

PAPERS† AND DISCUSSIONS

THE DIGNITY OF OTOLARYNGOLOGY *

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The department of otolaryngology represents one of the refinements of medical science and as such should be bounded by no narrowness of view or bigotry of opinion. Its members should be recognized as representing the highest ideals. Its officers should be chosen not by political intrigue or for the purpose of self-aggrandizement, but because of their actual worth and honorable conduct and their recognized ability. No other consideration has a place in a scientific body such as this. Political faith or religious creed become subservient to and are forgotten in the enthusiasm for scientific attainment. Believing this and recognizing in my predecessors men whose names stand for the noblest ideals and for the greatest scientific value in our specialty, I am profound in my appreciation of your action in placing me in the same "Hall of Fame" with such associates. No man can be unmindful of this commendation at the hands of his colleagues, and so I wish in these poorly chosen words to extend my sincere thanks.

The love and respect in which we all hold our specialty has been the motive that has given rise to the thought expressed in the title of this address and, as Stevenson puts it, "there is no subject of which a man should speak so gravely as that industry, whatever it may be, which is the occupation or delight of his life; which is his tool to earn or serve with; and which, if it be unworthy, stamps himself as a mere incubus of dumb and greedy bowels on the shoulders of humanity."

The history of otolaryngology is intimately interwoven with that of the American Laryngological Association, the American Laryngological, Rhinological and Otological Society, the American Academy of Ophthalmology and Laryngology and this, the Section on Laryngology, Otology and Rhinology of the American Medical Association. In the early days of this specialty laryngology played the most important part. Its adherents were big men, who as pioneers exerted their utmost to place this branch of medicine on a high and dignified plane. That they succeeded in launching this department on a successful career has never been questioned, notwithstanding the criticism and ridicule with which the laryngoscope, a so-called toy, was received by the general profession. One has but to read the address of Louis Elsberg at the first meeting of the American Laryngological Association to appreciate the ambitious future planned for that society which, in a measure, reflected the hopes of those interested in this specialty.

Among other things it was the wish to develop a proper nomenclature for the diseases with which we deal and to increase the importance of our specialty by the establishment of chairs of laryngology in the various medical schools. While much has been done toward clarifying the nomenclature used it cannot be said that this is as yet by any means perfect. The importance of our branch of medicine has been greatly enhanced, however, by the fulfilment of Elsberg's desire for more general instruction in medical colleges.

The entire trend of the addresses of early writers is in line with the loftiest possibilities. And while it is admitted that the special societies, special journals, and individual workers have in a measure more or less satisfactorily fulfilled the ambitious hopes of our pioneers and have advanced toward that goal at which our specialty would be raised to the highest and most dignified position possible, nevertheless it must be confessed that there creeps in from time to time much that is degrading and that detracts from its best achievements.

In the early days laryngology, as such, occupied a most exalted position and its votaries were men of the highest type. Rhinology was at that time but slightly in evidence; in fact, from 1855 to 1878 in a total of 1,766 papers collected by Elsberg, less than 7 per cent. dealt with diseases of the nose. As the specialty grew in point of numbers, rhinology, as such, attracted widespread attention. Coincident with the growth of rhinology there appears to have been a depreciation in the tone of the specialty. This must be largely attributed to an unscientific era and the beginning of an age of commercialism. "Catarrh" specialists became numerous and the unscientific management of diseases of the nose, not to mention the advent of charlatanism in the treatment of these conditions, was perhaps the severest blow to the dignity of our specialty that it could possibly have received. Men entered the profession, and in certain instances are entering it to-day, with the belief that all that is needed to become a throat and nose specialist is a spray apparatus and an unblushing nerve for charging high or so-called specialists' fees. Many a case of deflected septum was treated by local applications, the temporary improvement being the result of a temporary reduction in the turbinate engorgement. Fortunately a halt to this state of affairs was called when surgery of the nose and accessory sinuses became the recognized field of the rhinologist. Later otology still further raised the standard and added to the dignity of our department and, although the early otologist was nearly as empirical as the early rhinologist, it is gratifying to record that no department of medicine or surgery has developed more rapidly or with greater or more accurate and intricate scientific advancement than that dealing with the organ of hearing.

Beginning then with laryngology and its high ideals carried out in practice, to which was later added the debasing influence of early rhinology, and again approaching the noblest principles of our profession by the addition of advanced otology, what is needed to continue toward that proud and dignified position which we all trust may be ours?

First and foremost we should demand a high moral tone of every man who enters our profession. The material tendency of the times has to a certain extent obscured the necessity of making our practical lives virtuous and righteous. The man who enters the profession of medicine with the proper appreciation of the nobility of his calling, however, will be led naturally to avoid the degenerating influences which so easily creep in. For men endowed with the proper sense of their responsibility and with due regard for the traditions and ideals of our profession it becomes a comparatively easy matter to disregard and to eliminate the commercial spirit of the age. The greed for gain becomes a vice and fee-splitting and commissions become abhorrent.

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† As the footnotes indicate, certain papers are here printed in abbreviated form.

* Chairman's address.

In addition to a strong underlying nobility of character it becomes necessary to fortify oneself with the proper preparation. Mere sentiment cannot bring about any sort of practical results. The standard of premedical education has been gradually raised and in no department is it more necessary to possess the highest scientific and literary attainments than in our specialty. The regular four-year medical course and hospital training are also only preparatory to the development of a competent specialist. In this connection it is well to call attention to the excellent report of the committee of the American Laryngological, Rhinological and Otological Society which was appointed to consider the best methods to be followed in the teaching of otolaryngology. Other societies will act in conjunction with this committee. The report, which has not been published as yet, outlines a tentative plan of study which must of necessity improve the quality of the men entering our specialty. It condemns, as we all should, the making of an otolaryngologist by a six weeks' postgraduate course and, as the report states, "it is time we had done with this farcical sort of preparation, if our specialty, worthy as it is of the best, is not to be dragged in the mire, as a result of the ignorance of anatomy, diagnosis and technic, displayed by a very large proportion of the rank and file of those who now style themselves specialists in diseases of the ear, nose and throat."

Lastly, much can be done in the every-day practice of our profession toward dignifying its position as a department of medicine and surgery. The slipshod, careless and unscientific management of many of our operative procedures have placed them in a class by themselves frequently looked on by the general profession as evidence of a trivial specialty. Even though patients seldom die as the result of our operative interference, even though Nature covers up the possible serious results of careless ear or nose or throat operations, even though perfect asepsis cannot be attained in every operation owing to the peculiarity of the field attacked, nevertheless every procedure should be treated with all the refinements of modern surgery. Just as we are making tonsillectomy a hospital and not an office procedure, just so should we treat the majority of all intranasal operations. The management of the middle turbinate is no longer confined to this structure but includes an attack on the entire ethmoid. Septum operations and intranasal approach to the accessory sinuses may be followed by dangerous consequences. The shock of many a so-called minor procedure, such as incision of the membrana tympani, has been known to have serious after-effects. The welfare of our patients, the avoidance of unfavorable complications and results, and the dignity of our calling demand that in operative interference wherever possible the office should give way to the hospital. The upright position should give way to the recumbent. Careful preparation of the patient, the cleansing of the face, covering it with a sterile sheet for intranasal work as in ear work and, in fact, every known method of surgical cleanliness should be insisted on.

These ideal, as well as practical, considerations become a compelling force which will increase our own self-respect, advance the standard of our specialty and raise it to the dignified position which its importance in medical science demands.

Metropolitan Building.

CONSERVATIVE SURGERY OF THE NASAL SEPTUM

IRVING WILSON VOORHEES, M.S., M.D.
NEW YORK

There is probably no operation in the entire field of otorhinolaryngology which is more frequently performed than submucous resection of the nasal septum. It seems wise, therefore, at this time to consider the reasons for operative attack on this structure.

In the first place, we must remember that the septum is in many cases a minor cause of nasal insufficiency. Such a thing as a straight septum is very seldom found, for the reason that Nature never builds any of her structures on absolutely mathematical lines. She is fond of turnings and windings, of curves and spirals, and usually travels by an indirect path to the goal which she has in mind.

Many of us have been surprised to find what we considered a badly deformed nasal septum in a patient having a good intake of air. In these cases there is often no difficulty in breathing, a fact which seems impossible from the examination. Before undertaking operative procedures in the nose, we need to make, therefore, a very careful diagnosis not only of the middle wall (septum) but of the external walls and of the accessory sinuses as well.

The causes producing nasal insufficiency may be far anterior, far posterior, or between these two extremes. Those far anterior in the vestibule of the nose are due to congenital or acquired deformity. One special type needs a word of explanation. We occasionally see patients in whom it is difficult to find a cause consonant with the symptoms of which they complain. On forcible inspiration, however, we find that there is a sinking in of the alae nasi, a valve-like action, which absolutely cuts off the air from entering the anterior nasal orifices. This is due to a weakening or insufficient development of the accessory muscles or cartilages in the wings of the nose; consequently on forced inspiration the strong negative pressure within the nose combined with the external atmospheric pressure produces a marked degree of occlusion.

The turbinates are also frequently responsible for nasal obstruction. This is due either to bony hypertrophy or to hypertrophy of the soft parts. Bony hypertrophy is relatively rare and occurs chiefly in the middle turbinate as a so-called "cystic" condition which in reality is simply an extruded ethmoid cell placed in the middle turbinal bone. Soft hypertrophy is either of local or constitutional origin. The local causes are vasomotor rhinitis, hyperplasia, polypoid degeneration, and swelling of the erectile tissue due to the inhalation of dust, irritating fumes, etc. The chief constitutional cause is chronic passive congestion due to intestinal stasis or to some heart or kidney condition.

Beside these causes, nasal discharge is a very important element in bringing about nasal insufficiency. This arises either in a sinus or comes from the mucous membrane. It may be acute or chronic. The acute occurs in rhinitis and sinusitis and in infectious diseases such as diphtheria and influenza. The causes of chronic discharge are either local or constitutional, and may be found in association with a bad heart, lungs or kidneys, a chronic gastro-intestinal disorder, or, in short, any disease which alters the quantity and quality of the normal nasal secretion.

In chronic sinusitis one of the important symptoms is the discharge of a thick purulent or mucopurulent, viscid, tenacious fluid which falls down into the nasal fossae, dries and forms firm, tough crusts. These may absolutely occlude the lumen of the nose and are often quite difficult for the patient to remove. Patients thus annoyed are frequently troubled with epistaxis because in their efforts to remove the accumulated crusts with the finger, hair pin, etc., they injure the nasal mucous membrane and bleeding is very easily induced when the nose is blown. If, therefore, a simple nasal deflection exists in such a case it does very little good to remove the septum since the discharge persists and therefore the obstruction also. Here the primary cause of nasal insufficiency is not bony obstruction, but what we may properly term "catarrhal obstruction." I have seen such conditions in patients having a chronic appendicitis and fermentation and putrefaction in the gastro-intestinal canal. There was marked improvement in the quality and quantity of the nasal secretion and in the breathing following appropriate internal treatment.

In the nasopharynx the chief causes of obstruction are hypertrophied posterior-inferior tips, adenoids (ends of the turbinates), postnasal discharge and choanal polypi. Posterior tips (hypertrophied ends of the turbinate) are an expression of chronic passive congestion, and are practically always an extension of inferior border hypertrophy of the lower turbinate. Adenoids in the adult are usually undergoing fibrous contraction and therefore only infrequently obstruct the choanae. Postnasal discharge not due to hypersecretion from the intranasal mucous membrane comes from sinus disease.

All the above-mentioned facts are well known, and my only reason for referring to them here is to present a background for this essay. I am confident that inexperienced and careless rhinologists are in the habit of ascribing every variety of nasal insufficiency to a deviated septum. This is unscientific and thoroughly reprehensible; for it is sure to bring an excellent operation, that of a submucous resection, into ultimate disrepute. There are at the present time too many *middle-line* operators—men whose surgical endeavors are limited to the septum, adenoids and tonsils.

The septal causes of nasal obstruction are deviations, thickening of bone or cartilage, old fractures and dislocations of the integral parts of the septum, spurs, ridges, gumma, abscess and the so-called tuberculum septi. For each and every one of these the submucous resection has been attempted by youthful enthusiasts. Needless to say, the diagnosis of the cause of the nasal insufficiency has frequently proved faulty. I have seen abscess and gumma operated on by the inexperienced who thought the case one of septal deviation.

What harmful or annoying results may follow extensive removal of the septal framework? These are, in brief, perforations, diminished resonance, particularly in singers, weakening of the external nose, subjecting it to deformity from subsequent injury, saddle-deformity, fracture of the cribriform plate with resultant meningitis, destruction of the anterior palatine vessels and nerves with attendant neuralgias and anesthesias of the upper air-ways probably due to deficient blood-supply, and the "flapper" effects. I am well aware that some, at least, of these results are infrequent; and, considering how constantly this operation is being performed by all sorts of men, from orthopedists to pediatrists, it is surprising that bad results are not even more common. There is, however, a growing tendency on the part of many of us to perform a far too radical resection. Some surgeon-rhinologists are not content unless they have removed everything high up, far back and along the floor, doubtless because they have been unsuccessful in curing previous cases by a less radical operation. They have failed, however, to take into account the persisting "catarrh" which was probably the original cause of the insufficiency.

Now, the purpose of the submucous operation is to straighten, not to remove, a crooked septum. The bone and cartilage are normal, there is no disease of these structures requiring amputation. The septum is simply misplaced or redundant, that is, there is more solid framework than can adapt itself to the vertical plane. Therefore, why remove *all* of this framework? Obviously all that need be done is to take out the redundancy and fracture the crooked elements so that they may be held in place by simple splinting. Naturally enough, any great thickening of cartilage or bone or any angle which holds the flaps away from the middle line should be removed. These belong, however, to the rarer complications.

OPERATION

The procedure which I have been performing for the past year is in reality a submucous Asch operation. The same care is taken with the elevation and separation of the soft parts as is taken in the radical submucous method. Redundant curves and angles which cannot be reduced and held to the middle line are exsected. The remaining fragments are then fractured and placed in the vertical plane. This can be done with the instruments of the Asch outfit, or with the set devised by Roe of Rochester. When the deviation is limited to the ethmoid, I find it very helpful to go into the nostril with the little finger wet with mercuric chlorid solution or anointed with sterile petrolatum. It is important that the finger-nail be trimmed very close in order to avoid wounding the mucous membrane. The perpendicular plate is then fractured by pressing firmly against it. This bone is often quite thin, and yields readily to this maneuver. Any simple method of packing can now be used. I prefer long strips of sterile gauze saturated with liquid petrolatum. The packing is begun high up and far back and gradually piled up in layers down to the floor. This prevents postoperative hematomas between the flaps and external hemorrhage as well. The packing is simply laid in snugly, not jammed in. In twenty-four hours it is removed. After-care is limited to the prevention and treatment of crust formations in the nose. The patient is cautioned to leave his nose alone, and is not even allowed to blow it for the first three or four days.

SUMMARY

The following simple statements may be used as a guide in conservative work on the septum:

Indications for Resection.—1. When treatment of an associated local or constitutional cause of nasal insufficiency does not give adequate relief of the symptoms.

2. When the deviation is probably the chief cause of obstructed nasal breathing or "drainage."

3. To afford more room when operating on the sinuses by the intranasal method.

4. Preliminary to operation on the hypophysis.
5. Preliminary to Yankauer's operation on the lacrimal duct.

Rules.—1. Before attacking the septum, study the outer walls of both nasal chambers at two or three sittings. Adrenalin (epinephrin) and a probe are indispensable.

2. Remove *only enough redundant* deviation to make room for fixation of the remaining fragments in the same vertical plane.

3. Put the septum in the middle line and hold it there.

14 Central Park West.

COMPLICATIONS THAT MAY ARISE DURING OR AFTER OPERATION FOR CORRECTION OF SEPTAL DEVIATION

G. W. MACKENZIE, M.D.
PHILADELPHIA

COCAIN OR EPINEPHRIN POISONING

With cocain the patient develops a paleness of the face, trembling of the extremities, and when most pronounced the patient faints; at the same time the pupils dilate slightly. Alcoholics develop loquacity and boastfulness, combined with fear. I have never observed any poisoning effect from cocain that I could truly classify as alarming. I find that if the patient is placed in a prone position and reassured the symptoms pass over promptly. Amyl nitrate is perhaps the best physiologic antidote.

Epinephrin produces a set of symptoms entirely different from those of cocain. The patient complains of a throbbing sensation in the whole body, but particularly in the head and chest. The face becomes cyanotic, the pulse rapid and of high tension. These symptoms pass over promptly as a rule.

Air embolism may occur from the injection of Schleich's solution, and I have seen it on two or three occasions when a defective syringe was used (the piston fitted too loosely in the barrel).

SURGICAL COMPLICATIONS

Incomplete and improper primary incision of the mucous membrane may be a cause for delay in the first steps of the operation. I have seen beginners delayed in their efforts at separation of the perichondrium through failure to observe this precaution; at the same time they lacerated the mucous membrane considerably.

Adhesions.—So-called adhesions may be a cause for a delay in separating the mucoperichondrium farther, and in a measure may be responsible for a perforation of the mucous membrane. Many of these so-called adhesions do not exactly exist as such; they are found, however, occasionally where there has been a previous fracture. The best way to prevent this embarrassment is thorough filtration of the mucous membrane before beginning the operation.

Old Fracture.—Pre-existing fracture of the cartilage with overlapping edges may be a factor which is responsible for a perforation (with the raspatory) of the mucous membrane of the opposite side. Proper infiltration as outlined in my description of technic, together with precaution against using undue force, is the best means of avoiding perforation of the mucous membrane.

Perforation.—Unintentional perforation of the mucous membrane during the attempt at separation of the mucous membrane may be unavoidable occasionally. Such perforations are not so serious when recognized as when unrecognized, for when it is unrecognized the operator is likely to enlarge the perforation still more. The causes of perforation are imperfect infiltration of the mucous membrane, so-called adhesions, fractures with overlapping edges, recklessness and lack of experience. One or two buttonholes in the mucous membranes need cause no anxiety, providing two of them do not occur at corresponding points of the two sides; then they are liable to be followed by a through-and-through perforation. A successful means that I have found to replace the flaps, prior to applying the dressing, is to have the patient blow the nose forcefully, first one side, then the other.

The breaking off of a piece of the chisel in thick bone may rarely occur in those cases in which there is a low broad spur. To avoid it, I find it safer to remove smaller pieces at a time, rather than to attempt the removal of a larger piece.

Hemorrhage.—Excessive bleeding during the operation may be a complication of sufficient importance to cause alarm, and prompt some rhinologists to abandon further efforts at the operation. Excessive bleedings are usually venous, and occur during operation low down and in front; therefore, it is my practice to attack this quarter after all other parts have been taken care of. Secondary bleeding I have never witnessed and cannot speak of from personal experience.

Fracture.—Unintentional fracture of the septum near the posterior extremity may, in spite of otherwise excellent work, prevent the operator from obtaining as satisfactory results as had been anticipated. A faulty position of a fracture of this kind may be re-set into a more favorable position some days after the operation.

Packing.—Faulty packing of the nose may cause a curling of the edge of a torn flap in on itself, so that the mucous surface of the flap may lay in direct contact with the raw surface of the mucous membrane of the opposite side. This results in undue reaction and thickening, and delays recovery.

Faulty packing may result in getting a piece of gauze through a buttonhole and between the layers of the mucous membrane of the two sides and thus prevent prompt healing. Furthermore, it occasionally happens, as a result of faulty packing, that a piece of the gauze may work loose, posteriorly (aided by hawking of the patients), and dangle down into the pharynx, and even so far as to touch the epiglottis, causing gagging and fits of coughing. It is my practice in packing the nose to use short strips of one-inch gauze, so that in the event of a piece working loose posteriorly, it can be removed without disturbing the whole dressing.

Infection.—A mild infection of the wound may occasionally occur, especially where a pack is used. I have seen two cases, of my own, where the infection was quite severe. These severe infections showed intense swelling and redness of the whole membrane, accompanied with fairly profuse, thin discharge, the whole condition lasting two or three weeks. These cases showed at no time any apparent affection of the accessory sinuses; accessory sinus disease, however, together with the pack in the nose, probably is as frequent a cause of infection of the septum, after the operation as any other. One of the causes of severe reaction after the operation I have found to be the combining of the septum operation with one or more operations on the turbinates or accessory sinuses. Diseased tonsils or adenoids are not to be forgotten as possible causes for infection after the septum operation.

Flattening of the Nose.—Depression or flattening of the nose occurs rarely after the septum operation. The two most important factors leading to this deformity are a too liberal removal of the cartilage anteriorly and infections following the operation.

Hematomas.—These usually occur high up and anteriorly. It is manifested by a bilateral circumscribed swelling of the septum. It may be prevented, more or less, by proper packing of the septum as outlined elsewhere.

Erysipelas.—This is a complication about as prone to follow the septum operation as any other operation. I saw one such case while doing postgraduate work. This case, I recall, occurred in a patient who, after his operation, sat and conversed with another patient affected with erysipelas, in the waiting-room of a clinic. I never learned what happened to this patient eventually, for he was transferred to a hospital for infectious diseases.

Empyema.—Acute empyema of one or more of the accessory sinuses is a complication that may follow in the wake of the septum operation. Some of the cases suspected as being acute empyema may have been nothing more than acute recurrences of unrecognized chronic empyema. It is well, therefore, in suspected cases of empyema, to attempt its cure before operating on the septum, unless there are vital indications to the contrary.

1831 Chestnut Street.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. VOORHEES AND MACKENZIE

Dr. C. F. Welty, San Francisco: Prior to operating on patients in the recumbent position, I had considerable difficulty in the fact that my patients would become faint. Since adopting the recumbent position for my patients, I have had some unfortunate experiences, but none so bad as when I operated on patients in the sitting position. I feel confident that the danger of cases of so-called cocainism is lessened when one operates with the patient in the recumbent position. However, I do not believe that these conditions are due to cocain poisoning at all, but to fright and apprehension. Patients suffer more from the effects of the epinephrin than from the influence of the cocain.

Dr. R. Bishop Canfield, Ann Arbor, Mich.: I think one point is very important, namely, that a careful physical examination should be made of all patients who complain of insufficient nasal breathing. After making a careful examination of patients on whom I intended to operate I have been surprised to find many of them afflicted with heart and kidney lesions. The shortness of breath is frequently the result of heart or kidney disease, and the exact condition of these organs must be taken into account before making a prognosis as to the result to be secured by removing the nasal obstruction.

Dr. William E. Casselberry, Chicago: Although sympathizing, in part, with the conservative attitude of Dr. Voorhees, I feel that he overdoes conservatism. He asks why one should remove any straight portion of bone or cartilage from the nasal septum. The reason involves a fundamental principle of the submucous operation, that the forward part, even though straight, a condition which is rare, is to be removed to give proper submucous access to the crooked part behind it.

While it is true that systemic conditions may alter the quality and quantity of the secretion and otherwise contribute to production of nasal obstruction, yet in this respect our knowledge is so vague and relief by systemic treatment alone is so uncertain that to attain a definite cure within a reasonable period I have found it necessary to remove the obstruction surgically, afterward seeking to guard against recurrence by remedying, so far as possible, underlying systemic faults. Structural deformities and tissue overgrowths, when resulting from faulty metabolism, have usually been years in developing and their retrocession through systemic treatment, if possible at all, is equally slow. Not that complete submucous resection of the septum is invariably indicated, for I think all have occasionally found a limited modification to meet the requirements.

There are, I believe, three or more classes of cases in which one is justified in adopting a partial submucous operation. In the high thin Roman nose I have hesitated, even in adults, to remove such an expanse of bone extending forward to the tip of the nose and upward to the nasal dome, lest the lateral resistance of the external nose be impaired. By a modified submucous resection, sometimes unilateral, but often supplemented, done then or later, and by submucous removal of inequalities from the opposite nostril, I have secured, not a perfectly straight septum, which is rare by any operation, but a septum straight enough for practical purposes.

In a second class there is a moderate deflection, very slight at the front, but gaining volume toward the rear of the nostril and surmounted far back by a bayonet or rosette-like spur of very hard bone projecting across the nostril and even pressing into its opposite wall. The harm in this case is mostly by pressure irritation and obstruction from the spur component which, if closely removed, after loosening of the mucoperichondrium on one or both sides and if the weakened septum perhaps is then simply pressed toward the center line, leaves adequate nasal space. If, however, one judges the deflection component to be bad enough to necessitate the subsequent use of a splint one would instead better make the complete submucous operation. The prolonged use of a splint in connection with a removal of the Asch and Watson-Gleason methods, I would consider very objectionable.

The third class includes children under 14 or 15 years of age, in whom all agree that the complete operation is contraindicated.

Dr. Henry Bassett Lemere, Omaha, Neb.: In many cases in which patients appear for submucous operation the erosion on the portion of the convexity presented to the anterior nares has reached the extent of absorbing the entire thickness of the cartilage within the area of ulceration. If this is the case and the ulcerated area is healed before the operator sees the patient, he may find the location of his primary incision to have no septal cartilage. This has happened twice in my experience and I see no positive way to forestall the dilemma, as the resiliency of the septum is not markedly affected by this small absence of its cartilage. By making an incision further back I was able to avoid a permanent perforation. In packing I use a self-packer and a one-inch gauze bandage packing into a finger-cot. Dr. Casselberry is to be given credit for this method. I have found it cleanly and humane.

Dr. William L. Ballenger, Chicago: I agree with what Dr. Voorhees said, although he has a round-about way of explaining his work, and I think that it is somewhat far-fetched. In most cases we find obstructions due to some involvement of the ethmoidal sinus, a catarrhal ethmoiditis. This results in a watery discharge in the nose, which irritates the turbinate body and causes a turgescence. Such a condition is usually ascribed to some anterior obstruction in the nose. Again, I have found that a high deviation of the septum, or of the perpendicular plate, is more susceptible to improvement by operative measures than a low deviation. In other words, a large spur in the nose can be attended to with good results and with but little discomfort to the patient.

I think that Dr. MacKenzie is mistaken in saying that he is dealing with adhesions; I believe that it is normal tissue. It was Dr. Neuman of Vienna, I believe, who claimed credit for this operation. Dr. MacKenzie described a very difficult method of elevating. If you adopt his method you will have the same difficulties that he now has. The point of least resistance is directly under the bridge of the nose and here you can introduce the instrument under the cribriform plate and elevate the whole, but only part of the way; on the other side, you can elevate it the whole distance.

Dr. H. W. Loeb, St. Louis: We should make this a hospital operation and do it as nearly aseptically as possible. This work should not be attempted in the office. Again, this work is best done with the patient in the semirecumbent position. The operator can see better and the position is less fatiguing. There is less danger of cocain poisoning when the patient is in the recumbent position. The method of administering anesthesia is, after all, a personal equation. I cocainize the parts and follow with epinephrin. I have seen no bad effects from the use of epinephrin and cocain in this way.

Dr. MacKenzie spoke of the fibers observed when making the incision; if one does not cut entirely through the perichondrium he is apt to be confused by these fibers. The white, glistening cartilage should be noted before one starts to elevate.

I have been through all the stages of packing and I have found satisfactory results from packing removed within six or eight hours. I have had to repack only once in five years. I always have in mind the prevention of septicemia, in view of the fatal case that occurred under the care of Dr. Harold Hays of New York.

I disregard almost entirely the occurrence of hematoma. I have seen it occur, especially when the packing has been left in over night, but I have always found that after a short time it goes down. I have never had to make an incision for hematoma or abscess and I am not at all worried about these conditions.

Dr. Emil Mayer, New York: I wish to endorse the statements made by those who favor the recumbent position in these operations. I have never done a resection operation with the patient sitting up. Those who have been in the habit of operating on patients in the sitting position should try operating with the patient lying down. It may be a little more trying on the doctor, but it is certainly more comfortable for the patient. Patients operated on in the sitting position often topple over, and the operation has to be stopped until they regain their balance.

My method of using cocain applications is to apply a 10 per cent. solution for ten minutes by the watch; then a solution of epinephrin ten minutes by the watch. Then I can operate and have no trouble whatever. Occasionally, however, one meets the experience that I had the other day. The patient gave me some reason to believe that she had cardiac disturbances. I operated using the solutions of alypin and epinephrin, applying them to the mucous membrane ten minutes by the watch, and I had no trouble whatever.

The use of the rubber covering is at times a valuable procedure, but I have what I believe to be a simpler one which answers the purpose. I use a small piece of rubber tissue of two or three thicknesses and about one-half an inch in width. This I carefully introduce into the side of the nose, leaving a portion lying outside. I can pack against this all I like. It is my suggestion not to operate on young children; I think that all will agree with me in this.

The whole gist of the suggestions made in both papers is, be sure you are right and then go ahead.

Dr. George Paull Marquis, Chicago: One condition has given me much trouble, the symptoms of collapse. I have been in the habit of blaming the cocain for these symptoms. I have used the Schleich's anesthesia, the infiltration method, but have not used epinephrin in solution for some time because of a disagreeable experience. I have not had any trouble at all in my operations except from the hemorrhage which occurs after I chisel off the base. I have a comparatively bloodless field up to that time. I have been using peroxid of hydrogen for some time and with its use I have been better able to control the hemorrhage than when I used epinephrin.

Dr. Corydon G. Dwight, Madison, Wis.: Dr. Voorhees seems to have reverted to the old method of submucous resection. There is a point at which the middle turbinate comes in contact with the septum. This point should be kept in mind in these submucous operations. I think that the recumbent position in operating is advised by most operators. I have devised a table which can be elevated eleven inches; the patient can be placed on it in the complete or the semirecumbent position. An assistant controls the head by raising or lowering the table. The sides of the table are hollowed out, permitting the surgeon to stand in front of the patient.

I believe that the epinephrin solution should always be made from the fresh tablet sterilized.

Dr. J. Holinger, Chicago: Dr. MacKenzie spoke of doing the submucous resection and afterward at a second sitting, other operations necessary in order to give free breathing space in the nose. I should like to hear Dr. MacKenzie give his reasons for not doing everything at once. In my experience the cases are not infrequent in which a deviated septum is combined with hypertrophic turbinals, especially lower turbinals. If you do not correct both the septum and the turbinals you have not got the patient in a position to breathe through his nose. But why do you make two operations of it? I believe that we should do the entire operation at once. If there is a hypertrophy of a lower turbinal, remove it, and, if necessary, do the same thing on the other side. We shall often find swellings that are not confined to the nose alone, but which extend to the nasopharynx as well. In such cases you will get no results at all from any single operation. If the nose is properly cocainized, a complete operation will not, in my opinion, complicate matters.

Dr. S. R. Boyce, Madison, Wis.: In my experience the work on the middle turbinate described by Dr. Holinger corresponds to what should be done in cases with the so-called sigmoid deflection; therefore, I nearly always do a partial trimming of the middle turbinate in the larger side. If the inferior turbinate fills in the opposite side, it should be reduced to the normal size at the same time the septum is resected.

I should like to bring out in regard to the posterior ridge, which is often so marked and so far back. If one examines the nose with the posterior rhinoscope, he may not see this because the posterior end of the vomer is nearly always symmetrically placed. In these cases the triangular cartilage almost always overrides and comes down beside the septal ridge of the maxillary bone, so that in resecting the cartilage there is a long strip by the side of the maxillary ridge which might be missed. This I have found in many cases, and it usually terminates in a mass of bone and cartilage on one side about 2 cm. anterior to the posterior border of the septum.

Dr. Francis Emerson, Boston: There are several indications for operation, such as pressure symptoms, deficient drainage and impaired oxygenation. There is one type of case, the one with the high deviation of the septum, which is particularly obstructive when the patient lies down. These cases have a bad effect on the general condition, with restlessness and the disturbance of sleep from a diminished supply of oxygen. Whether one should do the partial or the complete resection operation depends on what has happened in the nose previous to the time of operation. If there is a deflected septum which interferes with respiration, causing irritation symptoms, there will be present an increased mucous secretion and a perverted or over-function from the increased irritation or stimulus, resulting in a catarrhal condition of the mucosa. If this process goes on, the mucosa becomes thickened and the ostia blocked; the end of the middle turbinate also becomes thickened, or the seat of a hyperplasia, and it may be necessary to remove enough of the middle turbinate so that an operation on the septum in order to relieve the respiratory trouble may not be necessary. I think that in considering septal operations, these secondary effects should always be kept in mind; if drainage is interfered with from secondary hyperplasia, there is the possibility that the relief which is expected from a septal resection will not be obtained.

Dr. Samuel G. Higgins, Milwaukee, Wis.: The method suggested consists, in fact, in an expansion of the upper maxillary. It should be borne in mind that children and young adults with badly deflected septums suffer from malnutrition, and in these patients we should improve the condition of the teeth and increase the size of the nasal spaces, correcting deviations, etc.

Dr. Howard F. Pyfer, Norristown, Pa.: The Asch operation has its place, but it should not be used in combination with the submucous resection. To injure the delicate mucous membrane with Asch's forceps invites a perforation from sloughing, if not from the mutilation.

Dr. Freer's flap method of resection may be used by some successfully, but in my hands it was a failure. The dangers of fracturing the cribriform plate, so much feared by Drs. Voorhees and MacKenzie, can be avoided entirely if, after the removal of the cartilage, the bony septum is bitten out above the ridge. This leaves a gap between the base and the horizontal plate of the ethmoid and thus prevents the transmission of any force used in breaking the bone with forceps or in chiseling the base. If a preliminary hypodermic of morphin is given before the use of cocain and if the cocain is dissolved in a 1:3,000 epinephrin solution, no constitutional effects and no operative shock will be experienced.

I believe that many perforations are due to faulty technic and blundering on the part of the operator, and not to atrophic membranes or adhesions. If an operator is having perforations (as I sometimes did when I used methods now advocated by Freer and Voorhees), he should abandon his technic and learn another and more exact one. Then he will cease making holes.

If gauze packing is used, first place rubber tissue next to the mucous membrane. There will then be no bleeding or injury to the membrane when the dressing is removed.

Dr. J. C. Beck, Chicago: Surgical pathology teaches that, after fractures, bone originates from bone, especially when it has periosteum attached to it. How one can prevent new bone formation after fracture I do not know. This is a point which I think should be borne in mind. I consider epinephrin a dangerous drug. I do not think it wise to use it.

I think that the position is a matter of choice. The recumbent position is better for the patient, but the operator can do quicker work with the patient in the sitting position. I recall one case, in which a patient was being operated on in the sitting position; he suddenly moved his head and a perforation resulted. This would not have happened if he had been in the recumbent posture.

Dr. James J. Pattee, Pueblo, Colo.: It is generally stated that the recumbent position is the proper position in doing septal work. Five or six years ago I was doing some work on the septum with the patient in the upright position. After he had been cocainized, he became faint. He was very nervous and I punched right through the vertical plate of the ethmoid. The injury was irreparable. These accidents will happen with the patient in the sitting position. If he is in the recumbent position they will not occur. I therefore recommend that patients be placed in the recumbent position and also that they be given morphin before the operation

Dr. G. Sluder, St. Louis: One complication has not been mentioned, the subsequent sloughing of the mucous membrane. I have seen this occur about five times. If the membrane is lifted and the septum straightened out, overcoming the deformity, you will find that for a week or ten days following the operation the patient will be all right. Then a perforation will appear. I had a case of this kind about six months ago. The patient, a man aged 20, had a perforation that was supposed to be disastrous. If any rhinologist saw it later, with or without asking particulars about it, he might rise up against me. I asked this young man to return to me in about six months. He did, and to my amazement and disgust he showed a second perforation in the posterior half; this second perforation was larger than the first and was a forward perforation.

The point raised by Dr. Beck is a timely one; I do not feel guilty when I make a perforation of this kind. I have had another case in which the opening appeared ten days after the operation. In this case I did a limited resection; in the first case I did a more extensive operation. I do not believe that we are justified in stating that we should not have these perforations and that if they do occur the operator is to blame.

There is no doubt that disaster will sometimes follow the use of epinephrin, but I get along with the least possible amount of the drug and have no trouble.

Dr. J. A. Stucky, Lexington, Ky.: First I wish to place myself on record as advocating a greater harmony among the otorhinologists and the general surgeons in their hospital work. Secondly, I believe that in this operation the patients should be placed in the semirecumbent position.

Nothing has been said about prevention of the toxemia from the use of cocain. I should not dare to use the same amount of cocain where I live as is used in the East and the West. The people of the South are peculiarly susceptible to the effect of this drug. In the East four times as much cocain and epinephrin is used as we believe to be necessary in the South. I never use over a 4 per cent. solution of cocain in my work. When I do a long operation, such as a submucous resection, I use this drug in combination with antipyrin; this gives complete anesthesia for three or four hours. Again, I never operate on a patient in whose case I expect to use a great deal of cocain without giving him a cup of black coffee before the operation. Coffee I think is one of the best antidotes against toxemia resulting from the use of cocain. I have learned this from doing operations under local anesthesia; this idea, I think, originated with Dr. E. W. Day of Pittsburgh.

I have stopped using gauze and the Berney's splint, and I never use the finger-cot with packing. I use the flexible tubular nasal splint devised by Dr. B. D. Kyle. This gives drainage and proper ventilation and there is no obstruction to nasal breathing. After this splint is introduced the parts are widened with forceps until the desired pressure is obtained. In our work, as in no other surgical work, proper ventilation and proper drainage are required. Nothing is more disagreeable than to have the nose stuffed up for twelve hours or more with packing; with this tubular splint there is proper ventilation and drainage from the start.

Dr. Margaret L. Noyes, Boston, Mass.: I should like to ask if the doctor has tried the method of sewing the septum after submucous resection. It seems to me a clean surgical procedure, and no packing is required.

Dr. J. G. Parsons, Sioux Falls, S. D.: To avoid the unfortunate results from sepsis in these septal operations, it has been my practice, after the flaps are in proper position, to insufflate an antiseptic powder which makes a satisfactory coating over the line of incision. It must be non-irritating.

Dr. Emil Mayer, New York: I am perhaps responsible for what has been stated in regard to the results of the Asch operation and in what measure this operation has met with success. I do wish to protest against any slur on the method. In its day it was the best operation. I still feel that in certain conditions of nasal deformity the Asch operation is the operation of choice, and it can be done with good results if it is done properly. Harm comes from its misuse and not from its proper use.

Dr. C. W. Wilkowske, Chippewa Falls, Wis.: During the last eighteen months I have used the following method: First, I make one or two applications of a 10 per cent. cocain solution with cotton swab; secondly, I apply epinephrin solution, 1:1,000, in the same manner; thirdly, I pack both sides of the nose lightly with gauze saturated with a 6 per cent. solution of quinin and urea hydrochlorid, leaving the packing in place from ten to twenty minutes. This insures a painless operation, accompanied by very little bleeding and is followed by no toxic conditions and no sloughing of the flaps.

Dr. George W. MacKenzie, Philadelphia: Dr. Welty's contention in regard to operating on patients in the prone position is supported by a great many other operators.

As a safeguard against cocain toxemia I always instruct my patients to eat a full meal before the operation, since toxic substances produce a heavier degree of toxemia when the stomach is empty than when it is full. We all know the effects of whiskey or tobacco on an empty stomach, especially when taken before breakfast. I advise the use of coffee as an aid in the prevention of cocain toxemia. For those who are accustomed to it I have, at times, advised smoking during or shortly after the infiltration; I believe that the smoking tends to relieve somewhat the toxemia of cocain. For the severe cases of toxemia following the use of cocain, amyl nitrite acts quite well. I believe that not more than one out of twenty cases of suspected cocain poisoning are really true cases of cocain poisoning, especially if one considers the small amount of cocain used in Schleich's method of infiltration (1.5 grains to 100 c.c. of water) and that of this solution but a small portion is used, and that a still smaller portion enters the circulation, for the greater portion of that injected is held between the mucous membrane and the cartilage or bone. I take exception to what Dr. Ballenger said regarding adhesions, because there are some real adhesions which result in cases of fracture. If one will reason out the pathology of the condition that results from fractures, he will find that a proliferative inflammation follows a new formation of tissue, and with it come the adhesions. On account of the small amount of cocain used, I do not often find it necessary to operate with the patient in the prone position, although I do operate on patients in this position when it is necessary. With the sitting position the operator sees quite well and can do the operation better no doubt than if the patient is in the recumbent position. If the patient manifests any symptoms of cocain toxemia, he should at once be placed in the prone position until the symptoms have passed. I do not like to cut off a dog's tail by inches, but I find that formerly, when we used this combination method, we have a greater degree of reaction and more frequent infections than we have now by the method advocated in my paper.

I believe that the tonsils and adenoids should be removed in advance of the septal operation; I think that infection is prone to occur after a septum operation from infected adenoids and tonsils. It is surprising what a large number of patients, adults included, have adenoids or, at least, some thickening of the posterior pharyngeal wall. Some patients whose adenoids are not particularly large develop an acute inflammation of the adenoids when the nose is packed. Infection which had been present, but latent, has been awakened and becomes active and from this source the infection spreads to an accidentally made wound of the septum.

ETIOLOGY, DIAGNOSIS, PROGNOSIS AND TREATMENT OF SPHENOPALATINE GANGLION NEURALGIA *

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In several papers on the sphenopalatine ganglion I have outlined what seemed to me the rôle[1] which it plays in nasal headaches and called attention to the topographic anatomy[2] of the district in which it lies, citing that the pterygomaxillary fossa is surrounded above, in front, behind and within by nasal structures and that in this respect it resembles an accesory nasal sinus; but that it is filled by the sphenopalatine ganglion, blood-vessels and connective tissue, instead of by air. I stated that inflammation in the surrounding nasal structures (accessory sinuses, sometimes the nasal membrane) produced by its extension to or the transmission of its toxins to the ganglion, a symptom-complex, partly neuralgic (painful); and partly motor, sensory and gustatory.[3] The neuralgic picture is pain in the root of nose and in and about the eye, in the upper jaw and teeth (sometimes lower jaw and teeth) extending backward under the zygoma to the ear, frequently making earache and pain in the mastoid; but severest often at a point 5 cm. back of the mastoid; extending thence to the occiput, neck, shoulder-blade, shoulder, breast and, when severe, to the arm, forearm, hand and fingers; with sometimes a sense of sore throat on that side.[4] Rarer additions to this picture are itching of the skin of the upper extremity, taste disturbances (parageusia), a sense of stiffness and muscle weakness in the upper extremity and fortification scotomata. Mild cases are described as a sense of tension in the face and stiffness or "rheumatism" in the shoulders. It may appear as constant pain with exacerbations, or it may stop and reappear cyclically as a migrain; or it may stop and reappear with stabbing sharpness as a tic.

The motor phenomena are changes in the appearance of the soft palate. Its arch is higher on the affected side, and the dimple which forms in the raphe just above the uvula in the act of gagging is deflected to the well side. The uvula is inclined obliquely to the well side. The sensory phenomena are slight blunting of the tactile sense of the soft palate, pharynx and tonsils, with like condition of the membrane of the nose of the affected side. The gustatory phenomena are confined usually to a slight blunting of the sense of taste on that side. Parageusia is rare. I have never seen all the manifestations in one case.

ETIOLOGY

Recently I have described[2] the environment of the sphenopalatine ganglion and stated that I believed that this nerve center became involved by extension of the inflammatory process from the postethmoidal-sphenoidal cells or from the membrane of the nose. Further observation strengthens my belief in this conclusion. Since then I have seen some postethmoidal-sphenoidal inflammations continue active for two years, with and without the usual symptoms of such inflammation, in patients who refused to be operated on, and then establish a typical sphenopalatine ganglion neuralgia which could be controlled by local application of cocain and was stopped by injection of phenol (carbolic acid[5]) alcohol into the ganglion, despite the fact that the surrounding causative inflammation remained. At that time I had seen practically only this type of case. This is by far the most frequent. Since then, however, I have seen twelve cases of systemic toxic origin. These arose in patients already well known to me in whom there was not a preceding local surrounding inflammation nor a general coryza. Cocain applied to the sphenopalatine foramen was always effective in stopping the pain. In one patient I have seen this phenomenon in very great severity on four different occasions. She has had violent neuralgias in other parts of her body. She has never had any nose disorder, but she is highly "neurotic." These attacks were clearly of some systemic toxic origin. It seems to me they correspond to the different intercostal attacks that she has had: However, cocain applied to the ganglion has always stopped the pain of this origin just as it has that of local origin. In fact, I think that these cases of whatever severity are more easily con-

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* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

[1] Sluder, Greenfield: Rôle of the Sphenopalatine (Meckel's) Ganglion in Nasal Headache, New York Med. Jour., May 23, 1908, pp. 989-990.

[2] Sluder, G.: The Anatomic and Clinical Relations of the Sphenopalatine (Meckel's) Ganglion to the Nose and Its Accessory Sinuses, New York Med. Jour., Aug. 14, 1909, pp. 293-298; Trans. Am. Laryng. Ass'n.

[3] Sluder, G.: Further Clinical Observations on the Sphenopalatine Ganglion (Motor, Sensory, and Gustatory), New York Med. Jour., April 23, 1910, pp. 850-851.

[4] Dr. M. A. Bliss is at present considering explanations for this unusual reference distribution.

[5] Sluder, G.: A Phenol (Carbolic Acid) Injection Treatment for Sphenopalatine Ganglion Neuralgia, THE JOURNAL A. M. A., Dec. 30, 1911, p. 2137.

trollable than those of local inflammatory origin, as might be surmised (the inflamed tissues not being so readily cocainizable); and are more apt to yield to simple cocainization or some tentative means.

In March, 1913, I found the text of W. Krause[6] which, although published in 1905, came under my recognition only then. In it he gives a description of the macroscopic anatomy of the sphenopalatine ganglion which is, so far as I know, unique, and may explain some of the clinical phenomena—an explanation of which I have not heretofore ventured. He states that instead of the single ganglion as usually described, it may be two ganglia, one suspended on each of the sphenopalatine nerves. He also states that it often protrudes into or through the sphenopalatine foramen to lie submucous to the nasal fossa, which fact explains how the above-described syndrome may be established in some patients by a coryza of ordinary severity without involvement of the postethmoidal or sphenoidal sinuses; and may subside on recovery from the coryza.

ETIOLOGY OF RECURRENCE

After the cure of the neuralgia a recurrence may be established in several ways. I believe that it makes no difference what means were used to cure the particular case.

1. The pain may be rekindled by inflammation around the ganglion just as it was produced primarily. In persons cured by injection such a recurrence is often transitory. At the time of a coryza they may have pain, which disappears spontaneously with the coryza; or it may be quite as severe and persistent from recurrent empymata, as the original condition, and require injection the second time.
2. Cases that were of toxic origin may be excited again by the same etiologic factors.
3. In very severe cases that were with difficulty controllable, the pain may be aroused again by mental shock, to the full severity of the original condition. I have seen this in four severe cases, one of which had to be injected again on this account.
4. In a small percentage of patients who have remained well after injection for three or four weeks, there recurs a moderate degree of pain, which is made worse by application of cocain and is soothed by application of an irritant such as silver nitrate over the sphenopalatine foramen. I do not know an explanation of this phenomenon.
5. Frequently I have seen pain recur in mild degree as a result of fatigue and disappear after rest.

DIAGNOSIS

The diagnosis of sphenopalatine ganglion neuralgia has called into consideration phenomena that heretofore have been inexplicable, an understanding of which I think I now have.

The above-mentioned syndrome may be produced by lesions of the nerve trunks which supply the ganglion,[7] namely, the second division of the fifth and the vidian nerves. It is supplied with sensory fibers by second division of the fifth. The vidian nerve is composed of the great superficial and the great deep petrosals, the former (great superficial petrosal) coming from the geniculate ganglion bearing motor fibers from the seventh and taste fibers which have arisen in the anterior two-thirds of the tongue and are to reach the brain by the fifth nerve[8]; the latter (great deep petrosal) being a sympathetic nerve, branch of the carotid plexus. Both the second division of the fifth and the vidian trunks frequently lie in very close association with the sphenoid sinus. They may be separated from the cavity in the body of the sphenoid by only an eggshell's thickness of bone; and this may be fact as early as the third year of life for the second division of the fifth, and the seventh year for the vidian. Each year of life presents the same possibilities, from childhood to maturity. I learned this from a recent inspection of the matchless material, property of Dr. Warren B. Davis, Keen Research Fellow of the Jefferson Medical College, Philadelphia. This material consists of 145 sections of the Caucasian head from two months fetal life up to maturity (twenty-five years) uninterrupted, several specimens for each year (except the eleventh—only one) showing the changes of each year. Therefore, when inflammation exists in the cavity which occupies the body of the sphenoid (the sphenoidal sinus or a postethmoidal cell) it may readily involve the associated nerve-trunks either by its extension or by its toxin passing through the thin separating bony wall. Two years ago I found that cocain readily passed through this wall and paralyzed the branches of the fifth[7] nerve. A lesion involving the nerve trunks central to a point of union of these trunks can reproduce or simulate the syndrome arising from a lesion of such a point of union. There exist, however, at this point of union, ganglion-cells. It is not a mere coalition of fibers. What part, clinically, these multipolar cells may play is as yet unknown; but the clinical fact remains that certain sphenoidal inflammatory cases simulate completely the typical neuralgia arising in the sphenopalatine ganglion.

The differential diagnosis may be made by the following facts:

1. Cocainization of the sphenopalatine ganglion stops the pain of a lesion in the ganglion proper.
2. It does not in any degree stop the pain created by the more central lesion of the nerve-trunks secondary to sphenoidal inflammation.
3. On the other hand, intrasphenoidal application of pain-reducing remedies, such as cocain, will under these conditions stop the pain—that is, a local anesthetic applied central to the ganglion is effective. In addition to these points of difference there is often a congestion at the site of the sphenopalatine foramen when the sphenopalatine ganglion is the starting point for the neuralgia. This is more particularly true for the cases of inflammatory origin. Cases of toxic origin usually show no change in the nose.

In summing up the various features of sphenopalatine ganglion neurosis[9] I mentioned all the phenomena I had seen up to that time. Since then I have seen two cases in able-bodied men which were accompanied by a marked sense of muscular weakness of arm and shoulder which vanished with the relief of the neuralgia. Once I saw a case of cyclical reappearance of this neuralgia accompanied by intense itching of the entire upper extremity. Ten times I have seen it appear as a tic douloureux of the above described distribution.

PROGNOSIS

The prognosis of sphenopalatine ganglion neuralgia is beset by several perplexities on which I have speculated. Frequently in severe cases that had been relieved by injection of alcohol, the benefit proved so transitory as to arouse the inquiry: Was it worth while? In contrast with these, however, are others of high grade which were easily cured by simple applications of cocain, formaldehyd, or silver to the inflamed sphenopalatine foramen district. Possibly all such variations could be satisfactorily explained were post-mortem material as frequently available in these cases as is the diseased lung or liver or heart. Possibly an exact knowledge of the anatomy of the ganglion in man (which is not known) would be helpful also. I feel, however, that I have a better understanding of some of these points now, from further clinical experience and a knowledge of work on collateral lines by May of London, although animal experiment, or post-mortem observation of my own is still wanting. The best treatises on anatomy give but a few words of description to its histology. The gray matter of the ganglion does not *involve all of the spheno*palatine branches of the maxillary nerve, but is placed at the back part at the point of juncture of the vidian nerve,[10] so that many if not all of the fibers of the sphenopalatine nerves proceeding to the nose and palate pass to their destination without being incorporated with the ganglion mass.

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[6] Krause, W.: Anatomie des Menschen, p. 547, Leipsic, Verlag S. Hirzel.

[7] Sluder, Greenfield: Anatomic and Clinical Relations of the Sphenoid Sinus to the Cavernous Sinus and the Third, Fourth, Fifth, Sixth and Vidian Nerves, Trans. Am. Laryng. Ass'n, 1912.

[8] Stewart, Purves: Diagnosis of Nervous Diseases, 3rd Ed., p. 142-143. E. B. Treat & Co., N. Y.

[9] Sluder, Greenfield: Syndrome of Sphenopalatine Ganglion Neurosis, Am. Jour. Med. Sc., December, 1910; Tr. Am. Laryng. Ass'n, 1910.

The ganglion may also receive fibers from the glossopharyngeal nerve conveyed to it through the small and large superficial petrosal nerves; this connection is sometimes described as a third sensatory root.[10]

The fact that herpes has never been seen as a part of this syndrome would seem to bear out this point, for herpes is never produced by lesions of sensory nerve-trunks; but only by lesions of the sensory ganglion cells. The ganglion cells, therefore, would seem to be a part of its motor and sympathetic attributes, which are constituted by the vidian nerve. It seems true from clinical experience, however, that the vidian nerve carries fibers which transmit the sense of pain also. Certain noses have been propitious for cocainization of the tissues internal to the assumed position of the ganglion with the effect of stopping entirely the pain of posterior distribution; and then, when the applicator was placed external to the assumed position of the ganglion the pain of anterior distribution stopped. When placed in the center it would stop both anterior and posterior pains. In other words, it would seem that the trunks of the nerves supplying the ganglion in these cases could be cocainized separately. This has seemed true also for injection and electrical (faradic) stimulation. Alcohol injected on the vidian side of the ganglion has produced great pain of posterior distribution: injected on the side of the second division of the fifth it made the anterior pain. The needle in these positions was attached to the faradic current, the other pole in the hand, with the same results.

The recent work of Dr. Otto May[11] seems to me to explain some of the transitory results of injection. He proved experimentally that the cells of the gasserian ganglion in the goat, cat and dog are not at all readily destroyed by alcohol; that they are quite resistent to its action even though the ganglion were surgically exposed and the injection put directly into its substance. He also proved that the nerve fibers are much more vulnerable to alcohol than the cells; but that the injection must be made exactly into the nerve trunk. When the alcohol was put merely around the nerve its effect, although marked, was transitory—the nerve quickly recovered its function.

So it would seem that inasmuch as the ganglion is small (5 mm.) and difficult of access, that we may assume that the transitory results have followed the instillation of alcohol into its environment rather than into its substance; and that the highly satisfactory results have followed the exact instillation of the alcohol into its midst, or into the trunks supplying it; and that the results may not be permanent even under these circumstances because these tissues are so difficult of destruction. (Whatever made the pain in the original cell, one may suppose, may make it in the regenerated cell.) And, on the other hand, the severe cases from which the patients have recovered so satisfactorily from surface applications to the membrane covering the sphenopalatine foramen and its immediate surrounding (whereby an inflammation was allayed), we may assume to have been produced by irritants to the cells and fibers without their actual structural involvement, their power of resistance being great, as shown by Dr. May. In this I am assuming these cells and fibers to be alike with those observed by Dr. May. These assumptions may likewise explain why the complete clinical picture has never so far been observed in a single case. The complete picture would require the complete involvement of all the cells and fibers of the ganglion alike, which in accordance with the above assumptions would not be apt to happen.

TREATMENT

In the treatment of these cases various remedies and several surgical means have been employed. Applications were made to the region of the sphenopalatine foramen of 2 per cent. solution of silver nitrate, 0.4 per cent. solution gaseous formaldehyd, 0.5 per cent. phenol with 0.1 per cent. iodin as a wash. In the more severe and stubborn cases injections of phenol-alcohol were used and in the worst the patients were operated on (intranasally) with the intention of removing the ganglion. But treatment has heretofore had only passing mention.

ANATOMIC CONSIDERATIONS

The treatment of these neuralgias has always been beset by difficulties which seem to me occasioned by the anatomy of these parts. The simple painting of the region of the sphenopalatine foramen will often be found difficult because of an irregularity on the septum, or the configurations of the lower turbinate, or both. Certainly, in a nose which presents a straight septum, a wide caliber nasal fossa, and a straight lower turbinate there can be no difficulty in reaching accurately the region of the sphenopalatine foramen. In such a nose, a needle bent at a right angle 0.5 or 0.66 cm. from its end could be introduced along the septum, to a point 0.33 cm. posterior to and slightly above the posterior tip of the middle turbinate; and could then be turned to a point outward which would bring its point to the membrane covering the sphenopalatine foramen. This could readily be punctured, thereby bringing the needle's point directly into the pterygomaxillary fossa at the site of the sphenopalatine ganglion.

This would seemingly be the simplest and best method of injecting medicaments into the ganglion. But even were this always a possible technic, it would still fail at times because the sphenopalatine foramen is sometimes placed posterior to the anterior surface of the pterygoid process, opening as it were into the vidian canal rather than the pterygomaxillary fossa.

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[10] Quain: Elements of Anatomy, Vol. iii, Part 2, p. 22, Ed. 11; Longmans, Green & Co., London, 1909.

[11] May, Otto: Functional and Histologic Effects of Intraneural and Intraganglionic Injections of Alcohol, Brit. Med. Jour., Aug. 31, 1912, p. 465.

Such a pterygoid process is V-shaped, apex forward. Injection under these conditions would be into the vidian nerve and not into the ganglion. It is for these reasons that I should like to call attention to the method of injection by means of the straight needle, which may be done in practically all noses, however irregular or narrow, and, under control, is almost infallible in its accuracy. The control consists in measurement of how far back the posterior tip of the middle turbinate the ganglion lies, irrelevant to the pterygoid process. The pterygomaxillary fossa is constantly reached about at its center, 0.33 cm. back of the posterior tip of middle turbinate; and it is this fact that I utilize in the therapeutic injection. Should the surgeon rely on the buttress of a solid pterygoid process to stop his needle when it is being pushed backward, as might seem perfectly feasible under the rule of the anatomy of the pterygoid process, he will find himself disappointed frequently because the pterygoid process is hollowed out by a prolongation of the sphenoidal sinus downward into it as far as the bifurcation of the plates. The needle then crosses the pterygomaxillary fossa and penetrates a thin film of bone to enter the sphenoidal sinus to meet with firm resistance only in the posterior wall of the sinus, or possibly not even there. It might readily enter the cranial cavity. The injection will then be into the sphenoidal sinus or cranial cavity. The sphenoidal sinus is sometimes set so far down in the body of the sphenoid that its lower aspect lies below the line of the needle thrust. Under these settings the needle enters the main cavity of the sphenoid as soon as it crosses the pterygomaxillary fossa.

The relation of the pterygomaxillary fossa to the posterior tip of the middle turbinate is one of the most constant in the nose. Even though the anterior aspect of the pterygoid process be V-shaped and be relatively forward of the opening of the sphenopalatine foramen it disturbs this relation little or none. The posterior tip of the middle turbinate marks the anterior limit of the sphenopalatine foramen. The pterygomaxillary fossa must of course needs lie external to the plane of the sphenopalatine foramen. These relations being borne in mind, it must appear that a straight needle introduced into the nose from the nostril to pass under the posterior tip of the middle turbinate at its origin from the lateral wall, in a direction backward and upward and slightly outward, must pass out of the nasal fossa into the pterygomaxillary fossa and enter the sphenopalatine ganglion or its immediate vicinity. The distance from the point of entrance of the needle so placed and ganglion tissue is almost invariably 0.66 cm.

The lateral wall of the nose plays an important part in this technic and its variations should be borne in mind: [The author gives these in detail in his reprints and in the Section Transactions].

INSTRUMENTARIUM

For the injection of the sphenolpalatine ganglion I use a simple straight steel needle 1 mm. in diameter. This is usually of considerable strength; and fastened in a heavy crossbar enables the surgeon to secure it in a strong grasp and put great pressure on it. My associates, Drs. C. A. Gundelach, H. E. Miller, and W. E. Sauer,[12] have suggested (and employed) a needle with a trocar and flange or ring from 0.5 to 0.66 cm. from its point to prevent too deep placement or insertion.

TECHNIC

From the preceding description it is evident that a straight needle introduced through the nostril in a direction backward, upward and slightly outward, approaching the lateral wall of the nose at a point in the middle meatus marked by the origin of the posterior tip of the bony middle turbinate, arrives almost at once on the anterior wall of the pterygomaxillary fossa. Should its point now be pushed backward 0.66 cm. it will usually enter the sphenopalatine ganglion. Experiment has proved, however, that it is better to enter the point of the needle 2 mm. anterior to the posterior tip of the middle turbinate. Pushed backward from this point it proceeds in a direction slightly more upward and more outward than it would from the point farther back, and thereby it strikes more nearly the center of the ganglion.

It may appear that the correct placing and insertion of the needle is a bit of technic of easy and certain execution. It has not, however, proved so in my hands. A number of specimens operated on show the possible failure. (Detailed description omitted for lack of space).

The lower turbinate frequently interferes with an easy and accurate placing of the needle point. This happens readily when the turbinate is placed somewhat higher rather than lower on the lateral wall. Under such conditions, the tip of the nose must be raised well up before a straight line may pass over the upper convexity of the body of the lower turbinate to reach the desired point under the posterior tip of the middle turbinate; and sometimes even then considerable downward pressure will have to be exerted on the lower turbinate by the needle as it passes backward in order to permit it to reach its destination.

Irregularities on the septum may interfere with the passing of the needle backward. They are apt, however, to be individual for that particular nose. The tubercle of the septum lies above the line sought by the needle.

I prefer the simple straight needle to be inserted under slight or great pressure, as the case may be. Under slight pressure it is very easy to measure 0.66 cm. distance insertion; but when it requires great pressure it is by no means easy to estimate this distance. For this reason I prefer to withdraw the needle when I think I have gone the right depth. While the needle is out I see that it has not been plugged with bone—that it is open—and then reinsert it into the opening it has been withdrawn from. On reinsertion the correct distance may be measured exactly because it requires no strength or pressure to replace it; 0.5 c.c. 5 per cent. phenol in 95 per cent. alcohol is then injected.

It is my practice to rest the hypothenar eminence of my hand on the patient's chin. In this way strong and controlled pressure may be put on the needle. It is desirable that it should not jump across the pterygomaxillary fossa, but proceed backward cautiously. Should the wall be hard and straight and not possible of penetration by pressure thus applied, the needle may be taken firmly by the cross-bar mentioned above and thereby rotated to and fro through a semicircle from side to side, using it as a hand drill to penetrate the bone. The lateral wall may possibly be too hard to be penetrated this way. Should it be, a machine drill or burr will have to be employed (see above). In the three attempts to remove the sphenopalatine ganglion I used this method of removing the lateral wall anterior to it.

I have already spoken of applications of silver nitrate solution and formaldehyd made over the membrane covering the sphenopalatine foramen (which is usually inflamed). Often this suffices to stop the pain. When it does not, I recommend that the ganglion be injected with a 5 per cent. phenol solution in water or in 95 per cent. alcohol. Formerly, I injected approximately two or three drops of this solution and very often it sufficed; but the number of failures seemed to me unnecessarily large. For this reason, I have gradually increased the amount of the injection to 0.5 c.c. This larger amount is more successful, possibly for the reason that the ganglion is small and probably frequently missed, to be influenced by the solution placed in its neighborhood. Alcohol alone, as advocated by Schlösser[13] in 1893, used for this purpose is intensely painful in these parts. For this reason I have added 5 per cent. phenol to it, which renders it painless in small injections—three or four drops. In 0.5 c.c. amounts it is sometimes followed by a slight sense of pain, which the patient usually recognizes as different from his neuralgia, and which lasts for from two hours to three days. I have used 5 per cent. phenol in water with possibly less satisfactory results than the alcohol combination. No untoward consequences have followed this procedure. This treatment has been highly satisfactory in the great majority of cases. Rarely, however, there recurs, in severe cases, a considerable degree of pain after from four to six weeks of comfort. In these cases, a rather strange phenomenon appears, namely, that cocain applied to the region of the ganglion is at once painful, and the deeper the cocainization the more so it becomes. And, on the other hand, irritants such as stronger solutions of silver nitrate are soothing. I have seen five cases of this type. This phase was transitory.

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[12] Dr. E. M. Holmes of Boston described a similar needle in an article entitled "The Intranasal Treatment of Meckel's Ganglion," Trans. Am. Laryn. Rhino. and Otol. Soc., May 9, 1913.

CLINICAL PROCEDURE

In practice I see what results are to be given by local applications. I always allay the pain with cocain which in new cases is often curative and follow this by application of formaldehyd or silver. When this fails to give permanent relief I inject the ganglion with 95 per cent. alcohol to which 5 per cent. phenol has been added. And I reinject it when the result proves insufficient or on recurrence of the pain, using cocain as my guide. Should the pain be aggravated by cocain I do not inject phenol-alcohol into it. In the one case in which I did inject such a ganglion, the alcohol, although immediately soothing, was later followed by great intensification of the pain.

SUMMARY

It would seem from the foregoing text that the clinical picture is usually rather clear, that some technical difficulties beset the management of the case, that the multipolar cells of the ganglion may from analogy be assumed to be resistant to chemicals, and that this assumption may explain the varying behavior of these cases; but that the treatment is scarcely less satisfactory than treatment of unmixed trigeminal neuralgia or tic. Removal of the sphenopalatine ganglion seems to me to offer less in prospect than removal of the semilunar ganglion (gasserian). It seems to me the issue here is far more complicated. With removal of the semilunar ganglion the pain usually (not always) stops. When the result is once right it would seem difficult to have that district again involved by local causes. It is too far central. But the sphenopalatine ganglion, were it completely removed, still leaves its supplying nerve-trunks exposed to detrimental association with the sphenoidal sinus; and inflammations of the sphenoidal sinus district by central involvement of its nerve trunks may reproduce the original picture.

The preceding text consists of observations drawn from experience with 214 cases including 311 injections, as well as experiment on the cadaver. Sixty injections were done as a nerve-blocking preliminary to Hajek's postethmoidal-sphenoidal operation. In one case under nitrous oxid I encountered sufficient bleeding to delay the procedure for a few minutes. This patient had a slight secondary bleeding seven days later. In another case occurring in the beginning of my experience I made the troubles worse by what I later realized was an injection of alcohol into the sphenoidal sinus instead of the pterygomaxillary fossa. In another of my early cases I unfortunately injected a ganglion which became more painful on application of cocain. The condition was made worse.

GLAUCOMA

In connection with sphenopalatine ganglion neuralgia I feel that glaucoma should be mentioned. (Omitted in THE JOURNAL for lack of space).

Since the preceding text was completed Dr. E. M. Holmes[17] of Boston has reported forty-six cases treated by the injection of the sphenopalatine ganglion. [For discussion of this paper see author's reprint or Transactions, Section on Laryngology, Otology and Rhinology, American Medical Association, 1913.]

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ABSTRACT OF DISCUSSION

DR. H. W. LOEB, St. Louis: Dr. Sluder succeeded in drawing your attention to and educating you in understanding the influence of the sphenopalatine ganglion and the various pains about the face resulting therefrom, as well as the methods which have been developed in their relief.

It seems to me that there should be a more careful selection of the cases. Dr. Haskins of New York emphasized the influence of malposed teeth which stomatologists are able to relieve. Many patients come to the aural surgeon with symptoms referable to the nose; the skiagram shows malposed teeth and all the symptoms referable to the nose are entirely cleared up on removal of these teeth. In these instances relief is premised by some other method of procedure. There are many cases with almost unbearable pain resulting from conditions in the nose; these are entirely cleared up on removal of the teeth after skiagram has been taken which shows that these teeth are malposed.

There is one point to which I would take exception, the diagnostic indication for cocainization of the sphenopalatine region. For instance, in the nerve fibers coming to the sphenopalatine ganglion with its sensory impressions, there might be a point of irritation to which the application of the cocain might afford relief; but this does not stop the pain that is more distal, and that may be relieved. This condition is therefore not at all diagnostic unless the cocainization is done through the end organs. Cocainization of the sphenopalatine ganglion region in cases of these neuralgias causes a cessation of the pain if certain fibers in the nerve are carried there. This may be a mere quibble, but it merits consideration.

DR. CORYDON G. DWIGHT, Madison, Wis.: I should like to ask if any member of our association has met with cases of glaucoma and, if so, how many examinations he would make in getting Dr. Sluder's gross number. Dr. Sluder has found glaucoma more frequently than I have in these cases of sphenopalatine ganglion neuralgias and it may be because of my fault in making a diagnosis.

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[13] Schlösser: Erfahrungen in der Neuralgiebehandlung mit Alkoholeinspritzungen, Verhandl. des Kongresses für Inn. Medizin, 1907; Wiesbaden, J. F. Bergmann.

[17] Holmes, E. M.: The Intra-Nasal Treatment of Meckel's Ganglion, Trans. Am. Laryng., Rhinol. and Otol., Soc., 1913. For discussion of this paper see author's reprint or Trans. Soc. Oto-Laryng., A. M. A., 1913.

Dr. Greenfield Sluder, St. Louis: Dr. Loeb spoke of Dr. Haskin's work, which seems to me irrelevant to the subject in hand. Concerning the point that Dr. Loeb raises regarding the diagnosis, it seems to me that there is no reason to assume that the point of irritation is some place distant from that which shows the irritation. This point was once raised by Dr. Scholtz of St. Louis, and since that time I have made the experiment *many* times, namely, cocainized some other point in the nose which showed no irritation. The result was uniformly a failure. Cocainization of the ganglion proper was uniformly successful in stopping the pain. Concerning what Dr. Dwight asked regarding glaucoma and its association with the sphenopalatine ganglion neuralgia: I have been on the lookout for it since 1908 and have seen it in each of the twenty-six cases that I have had the chance to observe. This observation was made primarily by Dr. A. E. Ewing of St. Louis in 1908, but since that time both Dr. Ewing and I have been exceedingly cautious in our statements bearing on these points. In all of these cases the pain of the glaucoma, however, has been uniformly controllable from the ganglion.

CHRONIC OBSTRUCTIVE MIDDLE-EAR DEAFNESS

GEORGE E. SHAMBAUGH, M.D.
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A great deal of confusion persists among practicing otologists regarding the diagnosis and especially the prognosis of those diseases of the middle ear which produce deafness as the result of obstruction in the sound-conducting mechanism. There is, perhaps, no form of ear trouble regarding the diagnosis and prognosis of which the patient has more just grounds for complaint than these cases of obstructive middle-ear deafness. The difficulty in diagnosing these conditions is sometimes increased by the combination of two distinctly separate processes; such, for example, as the development in middle life of a bony fixation of the stapes in a case in which there has been in childhood a long-standing middle-ear inflammation.

As regards the prognosis of obstructive middle-ear deafness, confusion has often been increased because of the effort to apply in the classification of these cases terms which a more recent study of pathology have rendered more or less obsolete. For example, the term "chronic catarrhal otitis media" has heretofore been applied to a rather large group of ear cases. This group included all those cases of chronic deafness resulting from obstruction in the sound-conducting mechanism which are not the direct result of residue in the tympanum from a chronic suppurative otitis media. Chronic catarrhal otitis media included, therefore, those cases of middle-ear deafness which result from the occurrence of the non-purulent middle-ear inflammations, and in which there are, as a rule, periods of long-standing tubal occlusion. To this group the term "chronic diffuse middle-ear catarrh" was often applied. Chronic catarrhal otitis media included as well those cases of obstructive deafness in which the membrana tympani and the eustachian tube are found to be normal, that is the cases in which there exists no evidence of either tubal occlusion or of a previous middle-ear inflammation. In these cases which gave the typical tuning-fork reactions of obstructive deafness the obstructive process was evidently restricted to the region of the labyrinth windows. To these latter cases the term "chronic circumscribed middle-ear catarrh" was often applied. The difference between the chronic diffuse and the chronic circumscribed middle-ear catarrh was often further emphasized by applying the term "hypertrophic middle-ear catarrh" to the cases of chronic diffuse middle-ear inflammation and the term "primary sclerosing middle-ear catarrh" to the cases in which the obstructive process was restricted to the region of the oval window. It was in this way that the term "otosclerosis" came to be applied to cases of primary fixation of the stapes, because this fixation was supposed to be the result of a chronic, circumscribed, sclerosing middle-ear catarrh.

In our present-day classification of chronic middle-ear process we exclude, of course, all those cases formerly described as circumscribed, sclerosing middle-ear catarrh in which the deafness is the result of primary fixation of the stapes. We still retain the term "otosclerosis" for these cases, but we understand by otosclerosis not a form of sclerosing middle-ear catarrh at all, but a disease beginning in the bony capsule of the labyrinth and in the large percentage of cases developing primarily in the region of the oval window and resulting early in a rigidity and finally in complete bony fixation of the foot-plate of the stapes.

In a present-day classification of middle-ear process there would be a distinct advantage if the term "chronic catarrhal otitis media" were dropped, especially because of the confusion in the minds of many which this term is certain to perpetuate. In its place might be used some such term as "chronic simple otitis media" or "chronic non-purulent otitis media." This term would convey at once an impression of the fundamental pathology of these cases, which is that of infection in the membrane lining the middle-ear chamber, with round-cell infiltration and thickening and the subsequent formation of fibrous connective tissue. This process is prone to acute exacerbation from time to time, usually associated with an acute infection in the nasopharynx. At these times secretion can, as a rule, be detected in the tympanum, not by the inspection of the drum membrane, because this structure is usually rendered too opaque from the chronic thickening, but by the inflation of the tube. This chronic middle-ear process may or may not be associated with a persisting tubal occlusion. In the cases in which the tubal occlusion has been a conspicuous factor there is sure to be a more or less marked retraction of the drum membrane. In other cases in which the occlusion of the eustachian tube has never been a conspicuous factor there is but little evidence of a retracted drum membrane. It is in these latter cases that the diagnosis from primary fixation of the stapes, otosclerosis, may not at times be so readily made. The membrana tympani, even in these cases, when the drum membrane is not retracted, usually appears more or less thickened and opaque; enough so, at least, to indicate the type of process involving the membrane lining the tympanum. The defect in the hearing in these cases arises from the obstruction in the conducting mechanism in the tympanum. The most pronounced disturbance in hearing arises because of the fixation of the stapes. When the tubal occlusion has been a conspicuous factor, the defect in hearing is often markedly increased by each acute exacerbation, which brings on a fresh closing of the tube. In such cases there is usually a marked improvement in hearing from a single inflation. On the other hand, the degree of retraction of the drum membrane is no index of the defect in hearing or of the improvement to be expected from inflation. It often happens that the occlusion of the tube which brought on the retraction of the membrane has long since disappeared and the drum membrane has been left in a retracted position. In these cases it is not unusual to discover no defect in the hearing.

Why it is that certain patients subject to recurring middle-ear infection, even with marked tubal occlusion, will suffer but slight permanent defect in the hearing while other patients subject to the same middle-ear infection, even though the tubal occlusion has been absent, develop serious interference in the conduction of sound-waves through the tympanum, is an interesting problem. The difference seems to hinge on the development of inflammatory adhesive bands in the tympanum. These bands are apparently the chief cause of the deafness. They connect the ossicles and the membrana tympani to the surrounding walls and are the result of the thickening during the acute inflammation of the membrane lining the middle ear. It seems probable that these thickened adhesive bands in the tympanum are often formed out of the folds of mucous membrane connecting the ossicles with the walls of the tympanum. Such folds vary a great deal in different individuals, being much more developed in some than in others. It is quite possible that this difference in the development of folds of mucous membrane in the tympanum is the fundamental reason why one person with recurring attacks of mild middle-ear inflammation develops a pronounced obstruction in the conducting mechanism, while another with a similar process suffers but a slight defect. A study of the normal folds of mucous membrane in the tympanic cavity takes on, for this reason, an added interest. The folds form, with the fan-shaped ligament placed around the neck of the hammer, very often a more or less complete partition between the attic and the cavum tympani proper. Accessory folds are most frequently found connecting the crurae of the stapes with the niche of the oval window. An additional fold is often found connecting the long process of the incus throughout its entire length with the posterior wall of the tympanum. Normally these folds show simply the two layers of flat epithelial cells with a few capillary blood-vessels lying between them. The folds are normally quite flaccid and do not interfere with the movement of the ossicles. When the membrane in the tympanum is subject to repeated attacks of inflammation these folds undergo the same process of thickening and stiffening as does the membrane lining the tympanum and in the cases in which the folds are well developed they must constitute an important factor in producing a rigidity of the conducting mechanism.

PROGNOSIS

The prognosis as regards progress of the deafness is on the whole better if the occlusion of the tube has disappeared and the existing defect in the hearing is dependent on changes in the tympanum which has ceased to be active, as the now patulous tube often indicates. On the other hand a persisting tubal occlusion usually indicates a process which is still active and one in which there will very probably be a further increase in the deafness. Another factor in the prognosis which must not be lost sight of is the development, in long-standing cases of middle-ear obstruction, of secondary degenerative changes in the cochlea. The presence of secondary changes in the labyrinth always makes the prognosis worse. The presence of these secondary degenerations in the internal ear can seldom be detected by either the Schwabach or the Rinné test, since in these cases both of these tests will continue to give the typical reactions of obstructive deafness. The labyrinth defect can best be detected by noting the defect for the higher notes of the Galton whistle.

Generally speaking, the chances of improving the hearing are less in those cases in which the occlusion of the tube has disappeared, or in which the tubal occlusion has never been an important factor, and the defect in hearing is dependent on the existence of adhesive bands in the tympanum. On the other hand, the defect in hearing which is found in cases of persisting occlusion of the tube, especially if secretion in the tympanum is present, is, as a rule, more readily improved by treatment.

CAUTION TO BE OBSERVED

It is highly important in the treatment of these cases to correct those conditions in the nose and throat which tend to keep up the middle-ear process, especially the presence of adenoids in the nasopharynx. The recognition of the conditions in the nose or throat which may be a factor in causing the middle-ear trouble, requires a careful examination and the exercise of considerable judgment. The indiscriminate operating on every anatomic variation which may be detected in the nose and throat in the hope of improving the hearing in these cases, should be discouraged. It is unusual for the middle-ear process to be kept up by conditions in the nose that can be improved by intranasal operations. On the other hand, the presence of adenoids in the nasopharynx always requires operative treatment, as do the faucial tonsils when these structures are subject to repeated attacks of acute infection.

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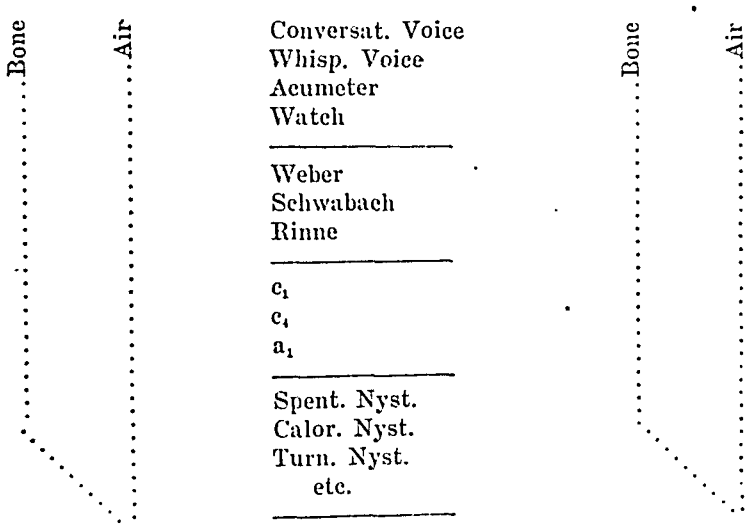
ABSTRACT OF DISCUSSION

Dr. J. Holinger, Chicago: As a whole, this subject is usually neglected. The examination of the semicircular canals in suppurations of the middle ear, which is taught in Vienna and other places, is given such an enormous amount of time that other conditions within the ear receive but scant consideration. Cases of hard hearing, nevertheless, are so much more frequent than the suppuration of the labyrinth that I think the ratio of 1 to 500 is not overdrawn. Many cases of different forms of hard hearing are overlooked or are not discovered because the proper technic is not employed in examination. This technic is not easier or more simple than that of the examination of the semicircular canals. We sometimes fail to realize that the physician with the widest experience in the pathology of hard hearing has examined during life, as well as by means of the microscope after death, probably not more than 130 or 140 ears. This is quite a large series. There are people who have not examined more than twenty-five or thirty ears, mostly post mortem, and their opinions are compared with those of the more experienced men. These facts should be taken into consideration in weighing evidence in favor of or against certain teachings of technic of examination, especially tuning-fork tests. I should like to call attention to one thing that occurred to me in these cases of obstructive deafness, as Dr. Shambaugh calls them: the hypertrophy of the posterior end of the lower turbinals. The normal turbinal reaches to only within several millimeters of the normal opening of the eustachian tube. Hypertrophy of the posterior end often covers the opening like a valve. Posterior hypertrophies of the lower turbinals most frequently cause hard hearing.

Dr. Cullen F. Welty, San Francisco: I wish to take exception to the nomenclature that Dr. Shambaugh has used, as it is confusing and misleading. Nomenclature that comes from definite pathologic lesions should be used; with subdivision when necessary. There are three great forms of deafness: (1) adhesive processes, (2) otitic sclerosis, (3) labyrinth deafness. All the mechanical hindrances naturally fall under the subdivisions of adhesive processes. Nomenclature should be adopted, as we would then know what others are talking about. Sometimes two forms of deafness are combined in the same individual. At times it is more or less difficult to separate an adhesive process from a beginning otitic sclerosis, but after repeated examinations with the forks I am sure that one will be able to differentiate beyond a question of doubt. The patients who receive the most benefit do so through operative interference. In other words, the patients cure themselves when the trouble has been removed; especially so with "bubbles in the ear."

Dr. George W. MacKenzie, Philadelphia: Dr. Shambaugh referred to the lack of assistance afforded by the tuning-fork tests in the differentiation of pure obstructive deafness from those cases of obstructive deafness with secondary internal ear deafness. A further suggestion came from Dr. Holinger of Chicago, when he referred to our lack of thoroughness in making functional tests of the hearing. The inner ear may suffer, more or less, in pronounced and long-lasting cases of deafness from obstructive diseases, as pointed out, long ago, by Alexander and others. Microscopic sections show degenerative changes in the cochlea with partial destruction of Corti's end organ. The pathologic changes in the inner ear can be determined clinically, more or less, through the careful application of our tuning-fork tests, especially the Rinné test. Those who are familiar with the method of recording the functional test findings in the old Politzer Clinic will recall the following features: On the left of the schema was represented the findings of the right ear, and on the right the findings of the left ear. In other words, we looked at the records as though we were looking at a patient facing us. In the middle of the schema was printed:



Under the right and left ear and to the sides were dotted lines runing vertically, one shorter than the other, to represent graphically the normal Rinné test. The longer dotted line represented the longer hearing from air conduction, and the shorter dotted line the shorter hearing over the bone. In the case of normal bone and air conduction, these dotted lines could be filled in. representing the normal findings, that is, positive Rihné, with bone conduction as long, but no longer than the normal (used as a control), and air conduction as long as the normal. In the case of a pure obstructive lesion we find the air conduction shortened and the bone conduction lengthened, and this lengthening is in proportion to the shortening of air conduction. This is quite mathematically so, as can be shown. In cases of marked obstructive disease we find the bone conduction so lengthened that it is actually longer than the normal. This may appear paradoxical; nevertheless it is so, and can be proved by experiment. In the event of such a patient developing secondary internal ear affection, the bone conduction begins to shorten. It need not become shorter than the absolute normal, but a relative shortening is a proof of secondary internal ear involvement. In some cases the shortening may be so marked as to bring it to the normal or even shorter than normal; then the diagnosis becomes quite easy. If a patient, for instance, shows a negative Rinné with a bone conduction equal to that found in a normal individual—knowing that bone conduction must be lengthened in a pure obstructive disease—it requires no stretch of the imagination to determine that we have here a case of obstructive disease with complicating inner ear affection.

Dr. George L. Richards, Fall River, Mass.: I recently saw a patient about 36 years of age who complained of a stopping-up in the ears. He was relieved after treatment, but only for a short time, and returned every three or four days. I never thought of the possibility of adenoids, at first, as there was no difficulty in breathing and the catheter was easily passed. As there was no permanent improvement, I examined him postnasally and found a large amount of adenoid tissue. This was removed and his hearing was at once permanently improved. We are often put off our guard because of the age of our patients and do not make the examination with the care we should. Diagnosis is difficult even when great care is used and tuning-forks as well. A man who has studied these cases and made many post-mortem examinations of the cases that he had examined clinically during life, said he was unable, even with the tuning-fork tests, to make an accurate diagnosis.

Dr. J. C. Beck, Chicago: So far as my experience is concerned I think that in cases of open tubes practically nothing is done to improve other conditions, whether in the nose or elsewhere. I have found, in cases in which the tube was not entirely blocked, but an irritated condition was being perpetuated in that region not ordinarily seen by the mirror, that if the examination is made after retracting the soft palate, masses of adenoids in the posterior pillar can often be seen. With the mirror as ordinarily used the parts do not come into sufficient view. These adenoids do not necessarily obstruct, but they are irritating and influence this condition. This is the view held by Dr. Shambaugh and Dr. Holinger.

Dr. Corydon G. Dwight, Madison, Wis.: In closing, I wish Dr. Shambaugh would give us something besides the operative treatment.

Dr. George E. Shambaugh, Chicago: The chief point I wish to bring out is that we must make more of a difference between these cases of obstructive middle-ear deafness than is often done. Too often it has been the practice to treat all cases alike; that is, to keep on treating patients whether there is any chance of improving the hearing or not. A careful study of these cases will usually make it possible to differentiate between those that are likely to be improved by treatment and the ones in which treatment is of no avail. In doubtful cases always give treatment a fair trial, but a fair trial does not mean treatment for a month or two. If the case is one that will be improved by treatment, improvement can be detected after a few inflations—about a half dozen treatments. In the prognosis, it is of considerable value to determine the evidence of a secondary degeneration in the labyrinth. This cannot be determined by either the Rinné or the Schwabach tests, but such a degeneration can be detected by examining the upper tone limit. There has been a great deal of unnecessary surgery performed in the nose in the treatment of deafness. It requires judgment to determine the conditions in the nose that may influence unfavorably the progress of a middle-ear process. In general, I should say that entirely too much importance has been attached to the effect of anatomical variations in the nose on cases of obstructive middle-ear deafness.

So-Called "Recurrence" of Cancer.—Now comes the question, How far are you going to trust your sense of touch for the diagnosis of carcinomatous lymph-nodes? Remember if you make a mistake on this point and remove a carcinoma on the side of the tongue, which is a small matter, you have left that patient with carcinoma, and do not try to soothe your mind by saying, when the lymph-nodes continue to grow, that she has some recurrent disease of the lymph-nodes in the neck. I do not know exactly what this word "recurrence" means, but I think it is simply a cloak for carelessness and ignorance.—C. B. Lockwood in *Clin. Jour.* (London).

TEMPOROSPHENOIDAL ABSCESS WITH MENINGEAL SYMPTOMS

DRAINAGE THROUGH THE CISTERNA MAGNA; MASTOID OPERATION; RECOVERY

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BOSTON

General purulent meningitis presents many problems of interest to the otologist. This condition is still frequently overlooked when it occurs as a sequel to purulent foci in the middle ear, as shown by the statistics of Kittredge. The diagnosis of general meningitis is at times attended by the greatest difficulties, even when the patient has the advantage of hospital care and can command the services of the various experts connected with other departments of medicine.

In dealing with this condition as a surgical problem the most radical conservatism and experience in this particular procedure as well are prerequisites for a successful issue.

The case that I am about to report may or may not have been one of general meningitis. Several points in the history as well as the physical examination of the case pointed strongly to a general meningitis. The surgical procedure by means of the Haynes operation showed that drainage through the cisterna magna is not attended by great difficulties or danger to the patient. A large number of cases, however, will be necessary to settle the question of mortality.

History.—A. McF., aged 22, single, day laborer, born in Scotland, was admitted to the outpatient department of the Massachusetts Charitable Eye and Ear Infirmary in the service of Dr. Plummer Oct. 26, 1912. He was sent into the house immediately and the following history obtained from his sister:

A discharge from the right ear was continuous until he was 14 years old. It was then quiescent with only an occasional temporary discharge, until one year ago. Since then the discharge has been more frequent. This last week there has been a constant purulent discharge with pain, headache, vertigo and vomiting. Sore back and neck with cramps in the stomach one day. Left ear occasional discharge.

Examination.—Patient well nourished and cheeks flushed. He repeats constantly, "Oh, my poor head," so that no direct answers can be obtained to questions. Sensorium cloudy. Patient has marked rotary nystagmus to the right. Pupils equal and react to light. Marked rigidity of the neck. Knee-jerks absent. Marked Kernig on both sides, also marked tache cérébrale. No Babinski or ankle-clonus. Lumbar puncture done at once and 3 c.c. of cloudy fluid withdrawn. Pressure not marked. White count 31,400. Blood-pressure 125. Urine negative. Cultures were contaminated and valueless. Eyes negative.

First Operation.—Ether anesthesia. On account of the marked turbidity of the cerebrospinal fluid, the rigidity of the neck, positive Kernig and tache cérébrale, cloudy sensorium and rotary nystagmus without focal symptoms, it was decided to do the Haynes operation for decompression and drainage through the cisterna magna. Accordingly the usual operating-table, with the head extension lowered, was utilized. The patient was etherized in the usual way, then turned over on his chest with the head well flexed and supported on each side, and the etherizer under the table.

An incision was made in the median line from the occipital protuberance to the spinous process of the axis and carried down to the occipital bone. The periosteum was reflected and the skull trephined an inch above the margin of the foramen magnum. A button of bone was removed. From this opening extending downward and outward on each side a triangular area of bone was removed about three-quarters of an inch wide at the base near the foramen magnum. After this wedge-shaped piece of bone was removed the dura was exposed and found bulging moderately. The occipital sinuses were not recognized. The dura was incised in the median line for about 2 cm., followed by a slight escape of spinal fluid. After the dura and arachnoid were opened the cerebellum prolapsed into the incision to a slight extent. At this stage of the operation the patient became very cyanotic and stopped breathing. He was at once turned over on his back, artificial respiration performed for several minutes and oxygen administered, after which he rapidly recovered. A cigarette drain was inserted between the edges of the incised dura and arachnoid into the cisterna magna for a quarter of an inch. The soft parts were allowed to fall together and the muscles were united by four silkworm-gut sutures. A large sterile dressing was applied with a retaining bandage. A shock enema and strychnin sulphate 1/10 grain were given subcutaneously.

October 27.—Patient made a good recovery and is in fair condition this forenoon and it was decided to explore the right mastoid.

Second Operation.—Ether again administered. The usual mastoid incision was made on the right side. The periosteum was reflected and the cortex exposed and found to be very thick and non-cellular. After the cortex had been removed the pus welled up into the wound, but not under pressure. The antrum was found and cleaned out. After entering the middle ear the tegmen was examined with a probe. An opening was found in the roof, through which the probe passed, followed by a sudden flow of foul, semipurulent discharge, which welled up from the cavity and about two tablespoonfuls escaped. Good drainage was established through the tegmen by enlarging the opening and a large rubber tube inserted without washing or manipulation. This was held in place by one silkworm-gut suture. A sterile dressing and bandage was applied. Hexamethylenamin (urotropin) 7½ grains was given four times a day.

Postoperative History.—October 28: Patient seems more comfortable but complains of severe headache and backache. Both wounds dressed. There is considerable serous discharge from the tube in the abscess cavity.

October 29: The wick in dura was changed and shortened. The tube in the abscess cavity was shortened. Directions that the external dressings be changed three times daily and that the tube be kept patent without removal, that is twice after the morning dressing.

October 31: The patient is comfortable but restless. Large doses of hexamethylenamin continued. Each dressing shows a slight backing up of pus.

November 2: Hematuria is present and the hexamethylenamin was stopped. The patient is restless but not unconscious. He continues to complain of pain in the back of the neck and head. Projectile vomiting present in the evening.

November 3: Restlessness continues. Temperature 103. Pulse and respiration normal. During my absence a confrère tried irrigating the cavity with normal salt solution. Pupils almost normal and light reaction improved. No tache cérébrale seen.

November 8: Very little pus escaped from the abscess cavity on dressing. Patient has been comfortable for the last twenty-four hours. Takes nourishment well. Neck wound entirely healed (thirteen days after operation).

November 11: The discharge is more serous, being thin, watery and clearer. Patient has nausea occasionally. Pupils react well.

November 14: Patient much brighter. Eats heartily. No discharge from the abscess.

November 16: Patient continues to vomit at intervals. A few drops of pus oozed out of the wound yesterday at the dressing. Middle ear not dry.

November 18: Patient very comfortable except for pain in the neck. No vomiting for two days. Eats semisolids. Slight discharge from the abscess cavity together with small pieces of disintegrated brain tissue. External dressing changed twice daily. Patient very sensitive to any obstruction of drainage.

November 19: Patient allowed a bed-rest. After sitting up for ten minutes he became dizzy and vomited a good deal. This evening he is comfortable and has a normal temperature.

November 21: No further vomiting. Mastoid wound closing. Slight discharge from the middle ear.

November 26: Patient vomited a little yesterday, after eating a fairly hearty meal, the first time for several days. Feels comfortable.

December 3: The wick was left out of the mastoid wound yesterday. Slight discharge from the mastoid and middle ear. Patient sat up a few minutes with no bad effect. Slight vomiting in the afternoon.

December 7: Patient has been feeling well with no symptoms until today when he had hiccups and vomited after eating. No headaches.

December 10: Patient vomited yesterday and had hiccups but is comfortable to-day. Slight discharge from the middle ear. Mastoid wound nearly closed.

December 12: Patient much better. Sits up daily with no ill effects.

December 15: Mastoid well epidermatized. Dressing omitted. Wound of Haynes operation shows a few exuberant granulations which were touched with silver nitrate. Patient sits up forenoon and afternoon and is gaining in strength. Appetite good.

December 18: For two days the patient has vomited several times. No other disturbance. Middle ear has been dry for three days.

December 24: Patient walks up and down the ward. Feels well.

Jan. 2, 1913: Discharged to outpatient department. Hearing test shows:

$$\begin{array}{ccc} \text{R.} & & \text{L.} \\ \frac{1}{25} & \text{W.} & \frac{18}{25} \\ \frac{13''}{32''} & \frac{\text{AC.}}{\text{BC.}}\ \text{R.} & \frac{13''}{20''} \\ & +\ \text{LW.} & \\ & \text{N.-Galton-N.} & \\ 96 & \text{Low} & 96 \end{array}$$

Atypical Symptoms.—The patient was brought in at the close of the service. His symptoms were urgent. It would have been instructive to follow out the chemical examination of the cerebrospinal fluid as suggested by Kopetsky. Unfortunately even the infective organism was not determined owing to contamination of the specimen. The condition of the patient did not justify delay for further study. Dr. Haynes' indications for operative interference were not all present. The blood-pressure was not above the normal limits. There was no edema of the papillae. The absence of the carbohydrates from the cerebrospinal fluid was not determined. There was a marked clouding of the sensorium and in addition a turbid cerebrospinal fluid, marked rigidity of the neck, positive Kernig, marked tache cérébrale, rotary nystagmus to the right and general headache. If general meningitis was present it was undoubtedly in the early stages, where an immediate drainage of the ventricles promised the most hope to the patient. While a localized meningitis secondary to a brain abscess might cause a great many symptoms of general meningeal irritation, it was a fair inference that in this case a general meningitis might be present, although later developments made it doubtful.

Haynes Operation.—The mechanical difficulties of the operation are not many. Some annoyance from the persistent bleeding was experienced on removing the button of bone. The margin of bone around the foramen magnum is thick and in the adult deeply placed under the skull. Neither of these difficulties is of enough importance to require extended comment.

IMPORTANT POINTS

Early Decompression.—The importance of early decompression need not be emphasized. The effect of increased intracranial pressure in depriving the vital centers of their blood-supply as well as the harmful retention of bacterial ptomains and toxins is well known.

Hexamethylenamin.—The value of hexamethylenamin, on which Cushing lays great stress, is dependent on sufficient circulation to enable it to reach the vital centers. Another requisite is an acid reaction of the secretions which is only present in the early stage of meningitis.

Difficulties in Drainage in Brain Abscess Cases.—No part of the after-care of a case of brain abscess requires more constant watchfulness than the drainage. Theoretically a cigarette drain after a careful and complete evacuation of an abscess cavity should be the ideal method. This permits the escape of the thin secretions and the leukocytes should do the rest. This is undoubtedly true when we have provided a free approach, so that the cavity can be completely evacuated, but when this is not done, or is not feasible, a large drainage-tube is better. When a tube is employed its lumen must be kept free, even if it is necessary to examine it several times in the twenty-four hours. The slightest blocking is apt to be followed by vomiting and increase in temperature.

Frequent manipulation of the cavity itself is to be deplored, but constant watchfulness of the drainage, which has been chosen to meet the requirements of the special case, is necessary and important.

No definite conclusions can of course be drawn from a single observation. The following points, however, I should like to emphasize as brought out from the study of this case:

CONCLUSIONS

1. The Haynes operation for drainage through the cisterna magna is not a difficult surgical procedure.
2. Further study is necessary to determine whether the Haynes or any other procedure is effective, except in the early stages of purulent meningitis.
3. This may depend on whether the infection is always accompanied by edema and serous effusion. It seems possible that, as a primary manifestation, there might be a plastic exudate, fibrinous in character, which would not drain until a later stage, when it became purulent. Even if this were so, a decompression operation might so relieve the intracranial pressure that the patient would have a chance to survive until the leukocytes could take care of the exudate.
4. The pressure of a large brain abscess makes the diagnosis of general meningitis in this case uncertain.
5. This case is reported in some detail to show also how a little blocking of drainage is followed by hiccups or vomiting, even as late as the third or fourth week, in cases of brain abscess.
6. Whether the drainage through the cisterna magna contributed to the successful outcome, may be an open question, it apparently did not add any danger to the patient.

520 Commonwealth Avenue.

ABSTRACT OF DISCUSSION

Dr. J. C. Beck, Chicago: I have had some experience in this line and only recently reported seven cases with six post mortems and I wish to repeat, certain testimony in reference to these cases. My results show *one* patient living. Beyond any doubt, this was a true suppurative case. The cerebrospinal fluid showed the presence of the pneumococcus, and this type of meningitis ends in recoveries. There were two other recoveries from this form of infection. They may recover from such an operation or with spinal puncture alone. I have had one tuberculous patient, as Dr. Emerson had; my patient is dead while his is living. I made my diagnosis by means of every point laid down, as well as the chemical analysis by Dr. Kopetski. In this case, when the patient was turned over he stopped breathing. Twice during the operation I attempted to turn him over, with the same result. There was no doubt that something pressed on the vital respiratory center. I made no diagnosis of abscess at that time. I operated and made a mistake by taking too long in performing the operation. I did a simple but extensive mastoid operation at the same time. The patient died the next day. The post-mortem showed a temperosphenoidal abscess without any demonstrable evidences of perforation, but on close examination a chronic point of infection was found in the subdural tract. The interesting point about this case is that secondary diffuse meningeal abscesses may have acute exacerbations. This patient got on a "drunk" and the meningitis followed. The other five cases that I have had bring up the point that operation in the later stages of meningitis is inadequate. An exudate is present, and pockets for the retention of material, both at the base and about the convexity, which cannot be drained from an opening. The operation itself is not a difficult one. I believe, however, that this operation is going to be overdone. Many of the patients who are operated on recover, but these are cases of serous meningitis. Men who are not experts in this line of work may cause death from this operation when recovery would result in the hands of one properly qualified.

Dr. George E. Shambaugh, Chicago: I wish to emphasize a point brought out by Dr. Beck: Be sure of the diagnosis. It seems to me quite possible that in the case reported by Dr. Emerson the patient might not have had meningitis. An otitis media in a child will sometimes produce marked symptoms of meningitis which will clear up in a few hours after the rupture of the drum membrane. An examination of the cerebrospinal fluid does not always give the information we desire in doubtful cases. I have recently seen a case in a child in which a marked increase in the cellular element, together with a culture showing staphylococci in the cerebrospinal fluid was present, and post-mortem demonstrated a cerebellar abscess, but no meningitis.

Dr. George W. MacKenzie, Philadelphia: I am inclined to think that the cases that have been reported may not have been diffuse purulent meningitis. I believe Dr. Emerson himself did not absolutely claim them to be. In cases of abscess of the brain, for instance, we may get any and all kinds of symptoms. There are several stages: the initial stage, or that of invasion; the secondary stage of incubation; the third stage, in which the symptoms are quite manifest, and, finally, the terminal stage which precedes death. We have symptoms due to the toxemia and we may find a variety of symptoms suggesting some febrile condition from the pressure. We may find symptoms referable to distant parts. This was pointed out by MacEwen in 1893. An abscess on one side of the brain may cause pressure of the medulla against the opposite margin of the foramen magnum, involving both motor and sensory tracts. We may have almost anything in the way of symptoms in brain abscess. The cerebrospinal fluid in these cases is not constantly the same. When the abscess is encapsulated, we may find the spinal fluid but slightly clouded and free from micro-organisms. In other cases in which the abscess is superficial or has ruptured into the ventricles the fluid would be cloudy and would contain bacteria. There is a reasonable doubt in most cases of cerebral abscess and diffuse purulent meningitis. and we must depend solely on clinical findings.

Dr. J. Holinger, Chicago: In *Ztschr. f. Ohrenh.*, I have published the history of a patient who recovered from typical meningitis. He died eight months later and the changes found at the post-mortem confirmed the diagnosis. Last spring, a girl, aged 18, was observed suffering from meningitis of unknown character. She had been operated on for tuberculous trouble of the external and middle ear about seven years previously. She complained of pain in her forehead, which disappeared after a few treatments. Two weeks later she became unconscious for three days. She improved, but suffered a relapse three weeks later, and was again unconscious for four days. She was afflicted with stiffness of the neck and would often cry out with the pain. At the lumbar puncture a clear fluid was discharged under pressure, which contained no microbes. When I operated I removed a button the size of a half dollar from the temporal bone, expecting to find a tuberculous abscess, but there was only a discharge under considerable pressure, of a large amount of clear cerebrospinal fluid. The discharge lasted for several days and the patient finally made a complete recovery. The diagnosis, from the evidence at hand, as well as by exclusion, was that the disease was probably of a tuberculous nature. Some forms of meningitis, at least, are amenable to operative treatment.

Dr. William L. Ballenger, Chicago: I agree with Dr. Emerson that these were not true cases of diffuse purulent meningitis. I shall like to emphasize the possibility and probability of an involvement of the labyrinth. There is nystagmus to the right, possibly a circumscribed meningitis, with a high degree of hearing. There also is the possibility that there was no circumscribed labyrinthine disease, but a central toxemia caused by the pressure from an abscess. These things are interesting in a speculative way. I should like to ask how long the rigidity of the neck lasted. Was it immediately relieved, or did it last some days after the operation?

Dr. Burt R. Shurly, Detroit: The scientific use of hexamethylenamin has not been mentioned in connection with these cases. If you are to perform a lumbar puncture, or puncture the ventricle, while the cerebrospinal fluid is dripping inject into the bowel 10 or 15 grains of hexamethylenamin and within one or two minutes the chemical test will prove the presence of the drug in the cerebrospinal fluid. It is surprising and marvelous how quickly this absorption takes place from the bowel into the lymphatics.

Dr. F. P. Emerson, Boston: I agree with those who discussed my paper that this was probably not a case of general meningitis. The eyes were examined and found to be negative. The rigidity of the neck lasted about twenty-four to forty-eight hours and then at once cleared up. My object in reporting this case was to call forth some discussion based on those cases which have been operated on by the Haynes method during the last year, thereby hoping to come to some definite conclusion, as to whether a patient, after some time, can be relived by any operation. The post-mortem findings in some of Day's cases showed a thick exudate in the floor of the fourth ventricle and pockets of pus in remote districts. This makes us skeptical as to whether late drainage by any method is effective.

THE HEARING FOLLOWING THE RADICAL EAR OPERATION

MY IMPROVED TECHNIC: THIERSCH GRAFT VS. TAMPON

CULLEN F. WELTY, M.D.
SAN FRANCISCO

I shall show by a series of statistics why my improved Thiersch graft is superior to all forms of tampon, in producing better hearing and in shortening the time of treatment as well as in being more comfortable for the patient. I shall also demonstrate from my own cases that reoperation is not at all necessary provided the work is thoroughly done.

The reason for the improved hearing is easily understood when it is remembered that the graft is applied at the time of the first operation. In about eight or twelve days the graft will be loose and should not be lifted away until it is, because granulations will develop, the granulating surfaces producing a mechanical hindrance which impairs the hearing; while if the graft is lifted off and the underlying surface does not bleed, you can feel assured beyond a question of doubt that the new

TABLE 1.—EIGHTEEN CASES OF RADICAL EAR OPERATION BY IMPROVED THIERSCH GRAFT

Case No.	Age	Sex	Discharge	Operative Findings	Hearing Before and After Operation		Duration of After-Treatment (Weeks)*
					Before	After	
104	26	F.	Childhood.	Cholesteatoma.	Whisper, 6 ins.	Whisper, 6 ft.	Six.
105	14	M.	Two years.	Cholesteatoma.	Speech, water, 6 ft.	Speech, water, 15 ft.	Four.
107	28	M.	Childhood.	Cholesteatoma.	Whisper, 3 ft.	Whisper, 3 ft.	Six.
108	19	F.	Childhood.	Cholesteatoma.	Whis'r, water, 12 ft.	Whis'r, water, 26 ft.	Four.
109	10	M.	Childhood.	Cholesteatoma.	Whisper, 1 ft.	Whisper, 26 ft.	Four.
110	14	M.	Childhood.	Cholesteatoma.	Whisper, 1 ft.	Whisper, 25 ft.	Four.
111	25	M.	Two years.	Cholesteatoma.	Whis'r, paper, 3 in.	Whisper, 6 ft.	Six.
113	33	F.	Childhood.	Cholesteatoma.	Whis'r, paper, 3 ft.	Whis'r, paper, 20 ft.	Three.
115	26	M.	One year.	Cholesteatoma.	Whis'r, paper, 15 ft.	Whis'r, paper, 26 ft.	Four.
117	16	M.	Childhood.	Caries.	Whis'r, paper, 1 ft.	Whis'r, paper, 6 ft.	Four.
118	12	M.	Five years.	Caries.	Speech, 3 ft.	Whis'r, chair, 25 ft.	Three.
119	16	M.	Two years.	Caries.	Whisper, 25 ft.	Whisper, 3 ft.	Four.
120	9	M.	Seven years.	Cholesteatoma.	Whisper, 1 ft.	Whisper, 6 ft.	Three.
121	29	F.	Childhood.	Caries.	Whisper, 6 in.	Speech, 1 ft.	Three.
122	29	F.	Childhood.	Caries.	Whisper, 3 ft.	Speech, 3 ft.	Four.
123	4	F.	Three and one-half years.	Cholesteatoma.	Not made.	Good.	Four.
124	30	M.	Childhood.	Cholesteatoma.	Whis'r, chair, 2 ft.	Whis'r, chair, 15 ft.	Five.
125	18	F.	Ten years.	Cholesteatoma.	Speech, 2 ft.	Whisper, 25 ft.	Four.

SUMMARY

Duration of after-treatment:

In 4 cases 3 weeks.
In 10 cases 4 weeks.
In 1 case 5 weeks.
In 3 cases 6 weeks.

Hearing, following operation, for whisper:

In 6 cases 25 feet or more.
In 3 cases 15 feet or more.
In 3 cases 6 feet.
In 2 remained the same.
In 1 case could not be measured, but good.
Three cases do not hear so well because of complications developed before or after operation.

Improved 14, or 78 per cent. Unchanged, 2, or 11 per cent. Made worse, 16 per cent.

* The duration of the after-treatment dates from the day of the radical mastoid operation and not from the day of the graft, which was four days later.

TABLE 2.—TWELVE CASES OF RADICAL EAR OPERATION BY IMPROVED THIERSCH GRAFT

Case No.	Age	Sex	Duration	Operative Findings	Hearing		Duration of After-Treatment (Weeks)
					Before	After	
127	21	M.	Childhood.	Caries.	Whisper.	Improved.	Three.
128	21	M.	Childhood.	Caries.	Whisper, 3 ft.	Improved.	Two.
129	31	M.	Childhood.	Caries.	Whisper, 6 in.	Whisper, 25 ft.	Ten.
130	38	M.	Five years.	Caries.	Whisper, 6 in.	Whisper, 18 ft.	Six.
131	20	F.	Childhood.	Caries.	Whisper, 3 in.	Remnants.	Four.
132	46	M.	Childhood.	Caries.	Whisper, 2 in.	Whisper, 15 ft.	Four.
133	34	F.	Fourteen years.	Negative.	Whisper, 3 ft.	Whisper, 26 ft.	Three and one-half.
134	17	M.	Eight years.	Caries.	Whisper, 6 in.	Whisper, 6 ft.	Three and one-quar.
135	9	M.	Three years	Caries.	Whisper, 1 in.	Whisper, 4 ft.	Three and one-half.
136	7	F.	Infancy.	Caries.	Whisper, 3 ft.	Whisper, 25 ft.	Four.
137	17	M.	One year.	Caries.	Whisper, 6 ft.	Whisper, 26 ft.	Three.
138	9	M.	Childhood.	Caries.	Whisper, 3 ft.	Not made.	Three.

Improved 100 per cent. One with labyrinth destroyed, the other lost.

TABLE 3.—THIRTY-SIX CASES OF RADICAL EAR OPERATION BY IMPROVED THIERSCH GRAFT

Case No.	Age	Sex	Discharge	Operative Findings	Hearing Before and After Operation		Duration of After-Treatment (Weeks)
					Before	After	
139	28	M.	Childhood.	Caries.	Whisper, 12 ft.	26 ft.	Six
140	11	M.	Childhood.	Cholesteatoma.	Whisper, 3 ft.	25 ft.	Four
141	10	M.	Childhood.	Caries.	Whisper, 3 ft.	15 ft.	Four
142	19	F.	Eleven years.	Caries.	Speech, contact	Speech, 6 ft.	Six.
143	19	F.	....	Caries.	Speech, 3 in.	Speech, 20 ft.	Three.
144	29	M.	Ten years.	Caries.	Speech, 1 ft.	Speech, 6 ft.	Not cured.
155	29	M.	Eleven years.	Caries.	Whisper, 6 ft.	Whisper, 12 ft.	Four.
145	12	M.	Childhood.	Cholesteatoma.	Whisper, 3 ft.	Recovered; lost.	....
146	20	F.	Childhood.	Caries.	Whisper, 6 ft.	Whisper, 26 ft.	Five.
147	65	F.	Childhood.	Cholesteatoma Labyrinth operation.	....	....	....
148	39	F.	Childhood.	Cholesteatoma.	Whisper, 2 ft.	Speech, 6 ft.	Six.
149	7	M.	Three years.	Cholesteatoma.	Whisper, 3 ft.	Speech, 6 ft.	Six.
150	12	M.	....	Caries.	Whisper, 6 in.	Whisper, 10 ft.	Six.
151	56	F.	Childhood.	Cholesteatoma.	Does not hear; labyrinth operation.	....	....
152	19	M.	Childhood.	Cholesteatoma.	Speech, 1 ft.	Speech, 1 ft.	Six.
153½	20	M.	Two years.	....	Whisper, contact.	Whisper, contact.	Four.
154	33	M.	Childhood.	Caries.	Whisper, 3 ft.	Whisper, 3 ft.	Six.
153	33	M.	....	Gun-shot wound of ear; removed bullet from brain.			
156	History lost		....	....	....	....	....
157	17	F.	Infancy.	Caries.	Whisper, 1 ft.	Whisper, 20 ft.	Five.
158	10	F.	Infancy.	Cholesteatoma.	Whisper, contact.	Whisper, 2 ft.	Five.
158½	49	F.	Childhood.	Caries.	Whisper, 3 in.	Whisper, 15 ft.	Five.
159	19	M.	Childhood.	Cholesteatoma.	Whisper, 1 ft.	Whisper, 15 ft.	Six.
160	10	F.	Infancy.	Cholesteatoma.	Whisper, contact.	Whisper, 5 ft.	Four.
161	21	M.	Six years.	Caries.	Whisper, 3 ft.	Whisper, 15 ft.	Six.
162	23	M.	Childhood.	Caries.	Whisper, 1 ft.	Whisper, 1 ft. Sinus thrombosis.	Ten.
163	49	F.	Childhood.	Caries.	Whisper, 3 in.	Whisper, 3 ft.	Four.
164	52	M.	Childhood.	Cholesteatoma.	Comatose.	Purulent meningitis.	....
165	9	M.	Childhood.	Caries.	Whisper, 3 in.	Whisper, 3 ft.	Five.
166	9	M.	Childhood.	Caries.	Whisper, 6 in.	Whisper, 6 ft.	Eight
167	34	F.	Childhood.	Caries.	Whisper, 3 ft.	Whisper, 20 ft.	Four.
168	37	F.	Twenty years.	Caries.	Whisper, 5 ft.	Whisper, 5 ft.	Four.
169	42	M.	Childhood.	Cholesteatoma.	No hearing, acute laby.	Whisper, 6 in.	Five.
170	12	M.	Two years.	Cholesteatoma.	Whisper, 20 ft.	Whisper, 6 ft.	....
171	3	M.	Two years.	Caries.	Not reliable.	....	....
172	14	M.	Childhood.	Cholesteatoma.	?	?	?

epidermis will develop in a very few days, having at first a pinkish appearance which gradually fades to white. What more could be wished for than the internal ear covered by a single layer of epidermis? Can you in your fondest imagination picture granulation tissue covered with epidermis that is not more of a hindrance to the sound waves than this single layer?

Should grafts be applied at a second operation, they will all remain and become firmly attached if the improved technic is used.

I believe that the granulation tissue which remains after a thorough curettement is also a hindrance—macroscopically it may be removed, but a something remains to fasten the graft and keep it in place; with the other procedure, a single layer covers the internal ear.

In a series of fifty-three selected cases, scarcely one required more than six weeks for complete epidermization. *This result speaks* for itself. This method lessens the likelihood of new caries developing, as it often does, in an ear that is tamponed because of the intense congestion and pus-formation over a long period of time.

In my own series of sixty-six cases in which I have applied the improved Thiersch graft it was necessary to reoperate in but one, and the patient was entirely free from secretion in four or five weeks after the second operation.

I believe that there is more likelihood of successful results from an incomplete operation by the improved Thiersch graft than by any other form of operative procedure because of the fact that the epidermis is so very thin that it will follow and cover individual cells that were not noticed at operation, and provided a large pathologic lesion is not left, it will correct itself or show as a small granulating surface that can easily be curetted with the sharp spoon as soon as it appears. It must be borne in mind that there is no granulating surface with the improved Thiersch graft and as soon as a granulation appears, it must be curetted away. I have found that such a spot packed with gauze saturated with sterile liquid petrolatum for twenty-four hours following the curettement will be much improved the following day and the place that was curetted can easily be detected.

SUMMARY

Male 21, female 14; lost history, 1.

Age 3 to 10, 7 cases; age 10 to 20, 10 cases; age 20 to 30, 7 cases; age 30 to 40, 5 cases; age 40 to 50, 5 cases; age 50 to 60, 1 case; age 60 to 70, 1 case.

The length of time required for complete epidermization was, in a series of twenty-nine cases without cerebral complications, the following:

In 3 cases 3 weeks.
In 15 cases 4 weeks.
In 6 cases 5 weeks.
In 4 cases 6 weeks.
In 1 case 7 weeks.

In this series of thirty-six cases there were the following brain complications:

1 case of gunshot wound of the ear and brain abscess; operation and recovery.
1 case acute purulent meningitis; operation, death.
1 case sinus thrombosis; operation, recovery.
2 cases acute labyrinthitis; no operation, recovery.
2 cases purulent labyrinthitis; operation, recovery.

In this series, there were nine cases of reoperation, five of my own; two patients did not recover from the acute operation and three from the radical. Two of these radical operations had been done prior to five years before. Four had been done by other operators.

In one of the purulent-labyrinth cases I had operated myself some five years previously but discharge continued.

The seven cerebral cases should not be included; detailed histories of two were lost; one of a child is not reliable, leaving twenty-five cases that can be concluded reliable.

Improved, 19 cases	76 per cent.
Remained same, 4 cases	16 per cent.
Made worse, 2 cases	8 per cent.

I have previously reported[1] twelve cases in which the improved Thiersch graft was used, two of which should be excluded; in every one of the remaining ten cases—100 per cent.—there was improvement. I have also reported[2] (see Table 1) eighteen cases in which the improved Thiersch graft was used:

13 cases improved	72 per cent.
2 cases remained the same	11 per cent.
3 cases were made worse	17 per cent.

Adding my selected cases, I have fifty-three—

42 cases improved	80 per cent.
6 cases remained the same	11 per cent.
5 cases made worse	9 per cent.

I have reported[3] 100 cases of radical mastoid by tampon and Thiersch graft combined. In the latter thirty of the 100 grafts were used. In some instances they were good, in others they came away with the dressing. It was at this time that I first began the oil dressings.

In eighty-nine cases selected—

57 cases improved	64 per cent.
26 cases remained the same	30 per cent.
6 cases made worse	7 per cent.

The added improvement in this series of cases in which operation was performed was dependent on grafts.

Dr. Buhe[4] found that out of 100 cases which he examined at the clinic at Halle, 34 per cent. improved, 36 per cent. remained stationary and 30 per cent. became worse after the radical operation. Improvement or no change of hearing is to be found practically without exception if the labyrinth and labyrinth wall are intact and the distance of hearing is under a meter for whispering speech.

Improvement may be expected even if the labyrinth or labyrinth wall or both are affected, if the remnant of hearing extends over less than one quarter of a meter. On the other hand, a diminution of hearing sets in in the case of patients who heard for the distance of 3 feet or more before operation if the labyrinth was intact and remained so. The hearing diminishes also, if the labyrinth or labyrinth wall or both are affected and the hearing extends over more than a quarter of a meter.

A. Schonemann[5] says that in general the hearing is not affected by the radical operation if the labyrinth was previously intact and was not damaged during the operation. Hammerschlag[6] agrees in general with Wagner's statements.

Out of thirty-three cases (Hammerschlag's):

7 improved	22 per cent.
3 made worse	1 per cent.
23 unaltered	70 per cent.

Grunert[7] reports:

39 improved	57 *per cent.*
4 made worse	0.5 per cent.
28 unaltered	40 *per cent.*

Grossmann[8] reports out of 212 cases:

93 improved	44 *per cent.*
51 made worse	25 *per cent.*
68 unaltered	33 *per cent.*

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[1] Welty, C. F.: Improved Technic of the Thiersch Graft Following Radical Ear Operation, THE JOURNAL A. M. A., Sept. 16, 1911, p. 962.

[2] Welty, C. F.: *Ann. Otol.*, Rhinol. and Laryngol., March, 1911; Arch. internat. de laryng., January *and February*, 1911, p. 70; Arch. f. Ohrenh., lxxxv; Jour. Laryngol., *London, June*, 1911.

[3] Welty, C. F.: California State Jour. Med., 1910.

[4] Buhe, E.: Verhandl. d. deutsch. Gesellsch. Naturforscher u. Aerzte, 74 Versammlung, Karlsbad, 1902, 11, 2, 44.

[5] Schonemann, A.: *Ueber den Einfluss* der Radikaloperation am Gehörorgan auf das Hörvermögen, Cor.-Bl. f. schweiz. Aerzte, 1906, xxxvi, 458.

[6] Hammerschlag: Wien. klin. Wchnschr., 1899.

[7] Grunert: Arch. f. Ohrenh., xl.

[8] Grossmann: Arch. f. Ohrenh., lii.

Gompertz[9] reports of eight cases:

4	improved	50 per cent.
2	made worse	25 per cent.
2	unaltered	25 per cent.

Records are found of fifteen cases of A. von Ruppert's,[10] out of which there were:

7	unaltered	47 per cent.
7	improved	47 per cent.
1	made worse	6 per cent.

Brown[11] reports that in the cases in which perception of high notes was shortened before the operation and in which vestibulary symptoms had been found previously, after the operation a considerable and sometimes even a complete loss of hearing took place. This also occurred in cases with a normal perception of high notes, but which presented pathologic increase or diminution of vestibulary reaction. Out of these cases in which the hearing distance was from 0 to 5 meters, before operation:

30 per cent. showed improvement.
10 per cent. remained unaltered.
6 per cent. became worse after healing.

Of those cases in which the hearing distance was from 6 to 9 meters:

50 per cent. improved.
50 per cent. became worse.

When the hearing distance was 10 meters or more:

14 per cent. improved.
14 per cent. remained unaltered.
72 per cent. became worse.

In general, therefore, we may say that the hearing is reduced after operation in the majority of cases; an improvement in hearing, however, might be expected in cases in which the hearing was considerably diminished before the operation took place.

C. A. Torrigiani[12] says that the hearing will be the better, the more conservative the operation. If the labyrinth is intact, the hearing will be better or unaltered; but if the labyrinth is affected, the hearing will be unaltered or worse. Shortening of the bone conduction gives a bad prognosis so far as the hearing function goes.

E. Ruttin[13] says that out of 100 cases the hearing distance in forty cases was, before operation, from 1.5 to 2 meters for conversation voice. In eight of these cases the hearing improved after the operation. In six it remained stationary, and in twenty-six it diminished. Two of the cases which improved, showed regeneration of the mucous lining in the tympanic cavity which was persistent after healing.

Out of sixty cases in which there was a hearing distance of 1.5 meters or less, only three showed any improvement after the operation and two became worse. (In these statistics those cases are not included which had previously shown any labyrinth symptoms.) We can, therefore, say that in cases in which the hearing distance is from 1.5 to 2 meters, a diminution of the hearing takes place, especially if only a small perforation existed before the operation was performed. In cases in which the hearing distance is less than 1.5 or 2 meters, no considerable diminution is to be remarked.

In the eight cases showing improvement and in which the hearing distance was over 1.5 or 2 meters, the hearing distance increased from:

4 to 6 meters
4 to 7 meters
3 to 7 meters
4 to 6 meters
4 to 7 meters
4 to 7 meters
4 to 7 meters

In those cases in which the hearing distance is less than 1.5 meters the improvement in three instances was from

1.5 to 6 meters
10 cm. to 1.5 meters
1.25 to 3 meters

Trautmann and Stenger (quoted from Ruttin) report out of sixty-nine cases:

25	improved	36 per cent.
20	diminished	30 per cent.
24	unaltered	35 per cent.

Schwartze (quoted from Ruttin) out of twenty-seven cases:

9	improved	33 per cent.
14	unaltered	52 per cent.
4	improved	15 per cent.

Brieger (quoted from Ruttin) reports: 43 per cent. of improvements, 8 per cent. made worse and 49 per cent. unaltered.

Stacke (quoted from Ruttin) reports 35.3 per cent. improved, 7.1 per cent. made worse and 57 per cent. unaltered.

Manasse and Wintermantel (quoted from Ruttin) report thirteen cases, or 65 per cent. improved, one case, or 2.5 per cent. diminished and six, or 30 per cent. unaltered.

Siebenmann (quoted from Ruttin) reports sixty-one improved, or 61 per cent.; eleven improved, or 11 per cent. and twenty-eight unaltered, or 28 per cent.

It goes without saying that bone conduction will be benefited only to the extent that the mechanical hindrance is removed and that mechanical hindrance can be judged somewhat by the appearance of the tympanic cavity. While with a lengthened or normal bone conduction, you can promise an improvement in hearing provided that the patient does not hear a whisper from a distance of more than 6 or 9 feet. This is the rule I follow myself and advise my patients accordingly.

In all patients under 50 years of age who hear a whisper from a distance of 5 feet or less, you can promise that the hearing will be improved, unless something goes seriously wrong with the operative procedure; for instance, removing the graft too soon (so that granulation tissue takes its place), or allowing it to remain permanently, in which case it will act as a mechanical hindrance. In patients who hear a whisper from a distance of 10 or 15 feet, I do not promise any improvement. In patients who hear a whisper from a distance of 20 feet or more, I say that hearing will be improved.

In fact I am so enthusiastic on this particular point that I am desirous of securing a few cases of chronic adhesive processes in order to do the radical ear operation with the improved Thiersch graft. Provided the patients have an intact labyrinth, and the hearing for a whisper is below 10 feet, I am almost certain of improvement. The radical ear operation was done some eighteen years ago by a French surgeon for this purpose.

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[9] Gompertz: Monatschr. f. Ohrenh., 1902.
[10] von Ruppert, A.: Ztschr. f. Ohrenh., liv.
[11] Brown: Arch. f. Ohrenh., lxxx.
[12] Torrigiani, C. A.: Arch. di Otologia, 1911.
[13] Ruttin, E.: Ann. d. mal. de l'oreille, 1908, xxxiv, 391.

It was abandoned because the result was not so good as wished for.

By removing the mechanical hindrance of the organized connective tissue, I can see a great advance in the field of otology as well as another indication for the radical ear operation.

I cannot imagine a more ideal surgical procedure for the improvement of hearing in chronic suppurative otitis media than this operation coupled with the improved Thiersch graft as my results speak for themselves; moreover, many otologists from the West can testify to the same. The time of the after-treatment is much shortened and is not at all painful.

In fact, the radical ear operation has lost its interest for me because it ceases to be a speculative procedure.

Shreve Building.

ABSTRACT OF DISCUSSION

Dr. William L. Ballenger, Chicago: I wish to confirm some of Dr. Welty's conclusions. If we operate early and granulations follow, cicatricial contractions are likely to be followed by impaired hearing. Ten or fifteen years ago when we used the Thiersch's grafting, I used the oil dressing; for fifteen years I used the oil dressing. I was much interested in his statement that these granulations do not follow the use of the improved Thiersch graft, but that so soon as they do appear they should be corrected. If they do not appear, why is it necessary to correct them?

I should like to know what tests were made after the operation. After one or two years, or even three years, many of these cases will show a great improvement in hearing because of cicatricial formation. Again, one who can hear a whisper at 20 feet is made worse by the radical operation. I should not object to doing anything except the modified radical operation. I have done the modified operation for five or six years in those cases which did not show any marked impairment in hearing, and almost universally there has been a marked improvement of hearing. In many cases the improvement is simply marvelous. I should do the modified radical operation in many of the cases in which Dr. Welty does the radical operation.

Dr. J. Holinger, Chicago: Microscopic examinations of chips of bone containing so-called cholesteatoma membrane show that this membrane is simply a scar over the bone. A layer of hornified epidermis-cells covers the bone and there is very little connective tissue between the bone and the layer of hornified epithelial cells. Often you will find under this layer of epidermis giant cells in typical Howship's lacunae. They indicate the process which is the cause of the cavities enlarging automatically. Dr. Welty spoke about improvement in hearing. If you do any promiscuous scraping you may cause hemorrhage and you are liable to destroy hearing by injuring the stirrup. Therefore, rather protect the little islands of epidermis. I cannot see how the transplantation of epidermis into the mastoid cavity will cause an improvement in hearing. The main point is to leave the stirrup alone. The incus and malleus may be necrotic and have to be removed, but then hearing is not normal. I started to make Thiersch grafts in 1893 and have used them for many years. In 1898 I showed a number of cases before the Chicago Medical Society which had remained dry for three and four years. Since that time I have used various other means to epidermize cavities of radical mastoid operations. I have discarded the Thiersch grafts and use other methods which are less troublesome to the patient and to me, and I obtain better and quicker results. I have often seen dry cavities after from three and one-half to four or five weeks. It seldom takes six weeks to get a result.

Dr. J. C. Beck, Chicago: I shall take up the subject where Dr. Holinger left off. In the reformed membrane there is epithelial tissue but no granulation tissue. It stands to reason that between the bone and the epidermis there must be some connective-tissue framework. I have demonstrated to my own satisfaction the pathologic condition of the bone operated on. There are six different types of cases: (1) osteosclerosis, (2) osteofibrosis, (3) osteocholesteatoma, (4) tuberculosis, (5) osteofibrosis with syphilis and (6) reduction of the sequestra after going on to the chronic form.

One man may report his treatment successful and another man may report his treatment successful, although the treatments differ. I am sure that the use of the Thiersch graft, after the thorough removal of the diseased process, will result favorably. The prompt application of the Thiersch graft hastens recovery, and this is very important.

There is a prompt and lasting improvement in the hearing if the diseased process is thoroughly removed and the Thiersch grafting done promptly.

Dr. Cullen F. Welty, San Francisco: To those of you who have not used the oil dressing, I can recommend it in the strongest terms. You can assure your patients that they will be well in six weeks or less. In this procedure the detailed technic must be followed to produce satisfactory results. The most important part of this paper has not been discussed at all and that is the amount of hearing following operation. The reason for this improvement is quite obvious when you consider the healing process. Such a series of cases has never been presented before, and this is all due to the graft applied by my method. I have patients who continue to hear a whisper at a distance of 25 feet after three years. I am more enthusiastic than ever in regard to operative treatment in chronic suppurative otitis media.

DIFFERENTIAL DIAGNOSIS AND TREATMENT OF CHRONIC LARYNGITIS

EMIL MAYER, M.D.
NEW YORK

As functional laryngitis is to be the subject of another part of this symposium, the differential diagnosis and treatment of organic laryngitis only is here presented. It is to be differentiated from affections of the larynx caused by constitutional affections such as syphilis, tuberculosis, lupus and scleroma; from the benign laryngeal growths, papilloma, mucocele, etc.; from malignant growths which so frequently involve the larynx; from prolapse of the ventricle; from lesions of the mucous membrane allied to affections of the skin as pemphigus, and from lesions caused by interference with the nerve supply of the larynx, the abductor and adductor paralyses.

It is not necessary here to go into detail of the differential diagnosis. The mere mention of the various ailments that may similate chronic laryngitis is quite sufficient to indicate what we have to bear in mind and against which we have to guard in making our diagnosis.

There is always a preceding acute inflammation, although the interval between the acute and chronic condition may be very short.

The treatment of this affection cannot be successful unless the etiologic factors are fully known. Of these first in line come the obstructive conditions of the nose, occasioning mouth breathing and preventing properly warmed air from entering the larynx.

Chronic catarrhal conditions of the nose and nasopharynx extend into the larynx by contiguity and produce a chronic laryngitis. Treatment must be vigorously applied to the nose and nasopharynx before amelioration of the laryngeal symptoms can occur.

One of the most frequent causes of laryngeal irritation and chronic inflammation is either the elongated uvula or its papillomatous tip. Simple as it may seem, it is surprising how frequently this condition is overlooked, as a single case in point may well illustrate.

A young woman, aged 20, came to me because of cough and constant clearing of the larynx, lasting for the past eighteen months, during which time she had been receiving treatment of all kinds of applications without benefit. I found the laryngeal mucosa very much engorged and by carefully elongating the uvula in depressing the tongue, found a long papillomatous tip which ordinarily curled up behind the uvula as it retracted on examination. Uvulotomy was followed by complete cessation of all the symptoms.

Hypertrophied lingual tonsils cause laryngeal irritation and require removal or galvanocautery applications before any direct treatment to the larynx.

Follicular pharyngitis may keep up a laryngeal irritation. For the rapid removal of these I have devised a curet.

Pressure in the auditory canal is another cause of laryngeal irritation. I have recorded a case of the cure of a constant cough and rasping by the removal of a plug of cotton which had been placed in the ear six months previous to the examination and forgotten.

Constitutional disturbances, digestive and cardiac, and pressure of new growths and enlarged glands are causative factors in producing chronic laryngitis, and the relief of those conditions, where possible, means ability to cure the laryngeal disturbances. Chronic laryngitis may be an occupational disease following irritation from gases or a dust-laden atmosphere, and in these the wearing of a respirator is a necessity as a preventive.

Alcoholics are especially susceptible, as also are males at the age of puberty. The use of tobacco is a causal factor and its continued use often retards a cure.

Sudden changes of temperature are most common causes of laryngitis.

Inflammatory conditions of the larynx occur from improper use of the voice in public speakers, actors and singers, and these are the patients who tax our capabilities to the utmost, for impairment of voice to them means a financial loss, often great. Their disturbances may range from a slight loss of tone in the upper register, which can only be noted by an expert, to a total loss of voice. These patients must be treated with the utmost care and firmness, as so much depends on their recovery, and harm may be done by over zealous treatment. One should hesitate before performing any operation on the nose or throat of any patient of this class without most mature consideration.

It must be borne in mind that the singer has learned his art with the very pathologic condition that we have before us and its removal may disturb the equilibrium of his vocalization, and should the laryngitis still continue, the failure to return to normal will be ascribed to the operative interference.

The conditions here are usually local hypertrophies, such as the singer's nodes, which are limited to a characteristic region, namely, the junction of the anterior third with the posterior two-thirds of the vocal cords and occur as a result of friction.

After the removal of any existing causal factor, our first order must be: Rest. The more complete, the better.

Local applications may be made of a spray of the tincture of chlorid of iron, half a dram to the ounce of water. In the more chronic conditions the following solution is given:

		gm. or c.c.	
℞	Iodin	1	grs. viii
	Potassium iodid	2	grs. xvi
	Glycerin		
	Water ....āā	90	℥ lss

Chlorid of zinc and solution of alum, 30 grains to the ounce, are also used, applied locally. During the day medicated lozenges containing benzoic acid or krameria are beneficial. Steam inhalations, specially with the resinous substances such as are contained in the compound tincture of benzoin, are especially soothing and relieve much of the irritation, but far better results are obtained if the medicated steam is applied methodically and regularly, as may be done in well-equipped inhalatoria, and these should always be under the direction of a competent physician. When this is not obtainable, special inhalation apparatus may be obtained, and this form of treatment may be carried out under the physician's personal supervision.

There are two methods of inhaling; in the first the medicament is atomized to impalpable vapor by means of sterilized air in a cabinet, while in the second the inhalation is through a sterile mouth-piece or nose-piece.

The medicated steam, a mixture of compound tincture of benzoin, one in twenty, is inhaled at a temperature of from 140 to 170 F. for about fifteen minutes. This is followed by inhalations of oily substances without the aid of heat, either of the two following being used:

		gm. or c.c.	
℞	Camphor	5	ʒ i
	Oil of tar	10	ʒ ii
	Iodin	2	gr. xx
	Creosote	5	ʒ i
	Menthol	5	gr. xxx
	Oil of sesame	50	℥ iv

or

a 5 per cent. solution of the following:

		gm or c.c.	
℞	Iodin	5	ʒ vi
	Oleic acid	15	℥ ii
	Paraffin oil	30	℥ iv
	Oil of sesame, to make ..	500	oi

The patient remains indoors for from fifteen to thirty minutes after each treatment. The use of tobacco is prohibited.

Faulty methods in vocalization should be corrected. Often a complete change of air and surroundings is advisable, and a few days or longer at some seacoast resort under favorable weather conditions may be of great benefit.

Cold sponging of the upper part of the body, the wearing of proper clothing, regularity as to meals, regulation of the bowels should be part and parcel of the directions toward the cure and prevention of recurrence of chronic laryngitis.

40 East Forty-First Street.

No Justification for the Rat.—Of all the parasites that have their being in and around the habitation of man, the rat has less to justify its existence than any other. As devoid of any redeeming traits as the fly, which has been the subject of a nation-wide sanitary crusade, the rat is a greater pest because of its depredations and its possibilities for harm in the transmission and perpetuation of bubonic plague in any community. The latter consideration is of more serious import in seaport towns, wherever they may be, and in those localities where plague has once appeared, but with the world-wide march of bubonic plague, in no city should its advent be considered as improbable.—R. H. Creel, *Pub. Health Rep.*

DIAGNOSIS AND TREATMENT OF SYPHILITIC LARYNGITIS

JOSEPH C. BECK, M.D.
CHICAGO

A remarkable change has taken place in the knowledge of syphilis in the past three years, in that the specific organism, the *Spirochaeta pallida*, has been positively identified as the etiologic factor, the serologic examination of the blood, the so-called Wassermann reaction, has been accepted as positive proof of the disease, and finally a great remedial agent has been added to our armamentarium in the form of an arsenical preparation, salvarsan, which has been demonstrated beyond question as the great sterilizer of the whole system of the spirochete. We are indebted primarily for this triad of discoveries to Professors Schaudinn, Wassermann and Ehrlich and their many earnest collaborators who have so dilligently taken up these modern thoughts and tried them out so as to put the management of this affection on a satisfactory basis. All text-books and articles that were published before these three discoveries of etiology, diagnosis and treatment may be properly called antiquated. One of the most recent articles and texts on this subject containing a wealth of information is by Felix Blumenfeld,[1] and I have made free use of it.

The pathologic pictures (Figs. 1 to 36) and the antiluetic treatment by mercury and potassium iodid, however, are still our mainstays, and very little new has been added in this particular. It is now a well-established fact that salvarsan alone is not a cure in the majority of the cases and mercury and potassium iodid are essential in the treatment. Syphilitic disease, confined purely to the larynx, is comparatively rare, and there are usually associated lesions of the nose, nasopharynx, mouth, tongue, and oropharynx. There are two principal forms of syphilitic laryngitis: (*a*) congenital and hereditaria tarda; (*b*) acquired.

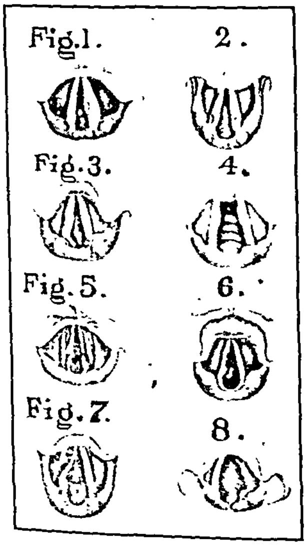
The former type, namely, congenital syphilis, according to Karl Gerhard[2] is very rare and is rarely diagnosticated except post mortem. In the hereditaria tarda one finds associated with this affection the triads of Hutchinson and the predilection of attack is the epiglottis. The ultimate changes are usually very severe and great cicatrices are found requiring surgical intervention.

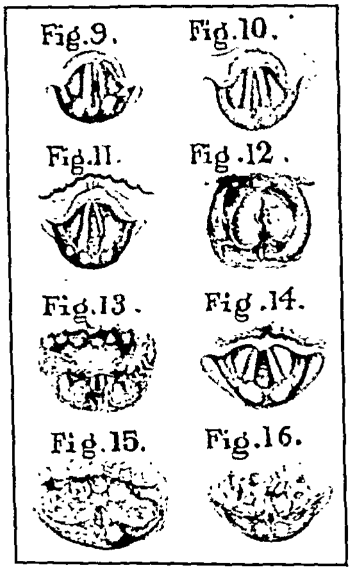
ACQUIRED FORMS

Of the acquired forms we must consider the following:

1. *Primary chancer.*—This is a great rarity, and only a few cases are on record. Morel Mackenzie, Moure, Pryat, Krishaber, and Castex have seen this condition and in all the cases the lesion was in the epiglottis. Sarremone also reports a primary chancer of the larynx, but the lesion was in the right ventricular band.

The syphilitic laryngitis, associated as the constitutional affection, may be classified as: (1) erythematous, (2) papular, (3) condylomatous, (4) diffuse infiltration, (5) nodular, (6) gummatous—diffuse gummatous infiltration, or solitary gummata, (7) perichondritis, which may either suppurate or not, and finally form cicatrices.





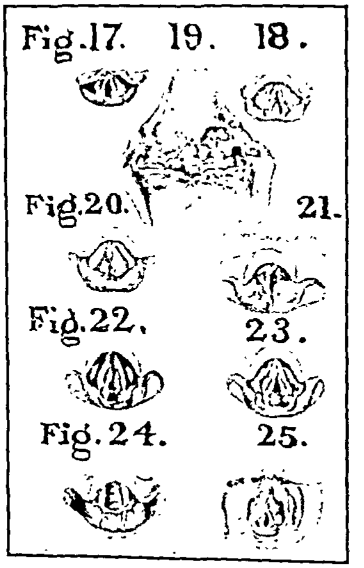


Fig. 1.—Erythema—small papule.
Fig. 2.—Papular forms.
Fig. 3.—Papular forms.
Fig. 4.—Papular forms.
Fig. 5.—Diffuse infiltrations with ulcerations.
Fig. 6.—Diffuse infiltrations with ulcerations.
Fig. 7.—Diffuse infiltrations with ulcerations.
Fig. 8.—Diffuse infiltrations with ulcerations.
Fig. 9.—Marginal ulcerations.
Fig. 10.—Subglottic ulceration and infiltration.

Fig. 11.—Unilateral extensive ulcerations.
Fig. 12.—Bilateral infiltration, edema and ulceration.
Fig. 13.—Gummatous formation, especially of the epiglottis and arytenoids, with breaking-down ulcerations.
Fig. 14.—Bilateral gumma of the arytenoids, without ulceration.
Fig. 15.—Marked destruction by ulceration of the entire epiglottis and one arytenoid.
Fig. 16.—Cicatrization of similar processes as in Figure 15.
Figs. 17-25.—Infiltration with ulceration and perichondritic changes.

The erythema may well be compared to a catarrhal condition, only much deeper injection of the mucosa, and at times may assume an edematous character. Lacroix[3] described such a form of syphilitic laryngitis. The papules are also of the early form of luetic laryngitis. Condylomas are not very frequent and also belong to the very early manifestations, although Aronson[4] observed a case which occurred nine years after the primary infection. These condylomas are usually situated on the edges of the vocal cords and frequently symmetrically. The infiltrated form of syphilitic laryngitis may be properly called the transitional stage from the early to the later form. The epiglottis is the most frequent location. The other regions of the larynx, however, are not infrequently infiltrated. These infiltrates may remain for a longer or shorter time before ulceration, but these defects are usually more superficial than the gummatous defects, and perichondritis is less frequent as a complication. The ulcerations are characterized by their sharp borders.

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[1] Blumenfeld, F.: Handbuch der speziellen Chirurgie des Ohres und der obern Luftwege, iv, 375.

[2] Gerhard, Karl: Haymann's Handbuch, i, No. 2, p. 1201.

[3] Lacroix: Arch. internat. de laryng., No. 6, 1897.

[4] Aronson: Arch. f. L[illegible], xxii, 92.

The nodular form of laryngeal syphilis is somewhat rare and bears a resemblance to lupus of the larynx. Lewin, who first described this affection, noted the rapidity with which these nodules broke down.

Solitary gumma of the larynx is more frequently present than it is diagnosticated and is frequently mistaken for other neoplasms. They vary in size from that of a pea to that of a walnut. It is usually deep red in color until the breaking-down process begins, when the color appears lighter.

The diffuse gumma of the larynx has a predilection for the epiglottis and not infrequently is the neighboring portion of the base of the larynx involved in the process. Frequently also the entire epiglottis is destroyed by the breaking down of the gumma. The epiglottis is often drawn to one side or the other, and in the final process becomes attached to the arytenoid so as markedly to obstruct breathing. When a diffuse gumma involves the cord, it is of a spindle form and of a very deep red color and when it breaks down has ragged edges.

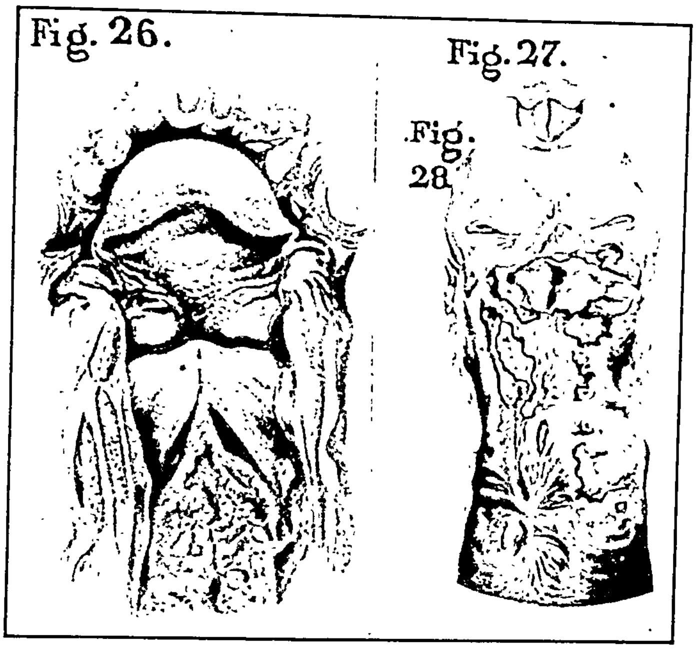


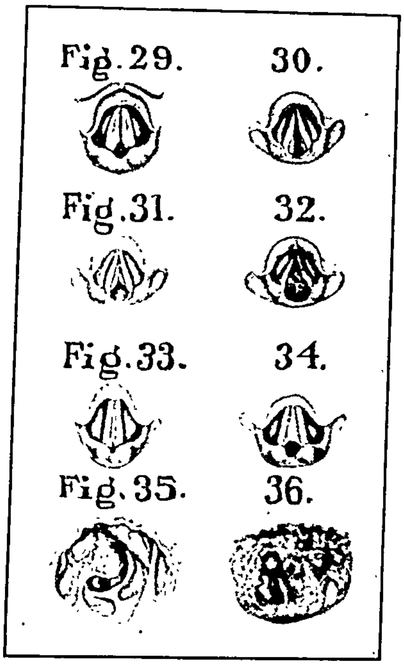
Fig. 26.—Gumma of the epiglottis, with subglottic ulceration.
Figs. 27 and 28.—Ulceration associated with cicatrization.

In the perichondritic form of laryngeal syphilis it is the arytenoid that is most frequently involved; it is a late secondary process. There is usually median placement of the cord and the arytenoid is fixed. In the breaking-down process or abscess formation, the arytenoid has a tendency to lean forward and inward, and since the ary-epiglottidean fold is usually very much swollen or edematous, one can expect considerable difficulty with breathing and be on the alert for surgical interference. In case of suppuration of this perichondrial process it may come to the spontaneous expulsion of the arytenoid cartilages by coughing. The next in frequency of involved cartilage in luetic perichondritis is the cricoid. This causes considerable difficulty in swallowing, as the posterior laryngeal wall is principally swollen. Should the anterior cartilaginous arc of the cricoid become involved with perichondritis, then great difficulty in breathing will result—in fact, there is danger of suffocation. One may recognize this form of perichondritis, as also that of the thyroid cartilage, by a subglottic swelling and deep red color, as well as a swelling which sometimes crepitates externally over these cartilages. Not infrequently is there fluctuation present, which is due to the presence of an abscess.

The end-results from all the forms of destructive laryngeal syphilis, but especially those of the perichondritis, will either be the formation of granulation tissue in the form of excrescences or cicatricial bands. Both of these will cause more or less dyspnea.

A form of laryngeal syphilis in which there are no evidences of being or having been any ulceration is known as parasyphilis of the larynx and is characterized by general cicatricial narrowing of the cavity of the larynx. Dittrich[5] and Turck[6] have already described such conditions under different titles, and in recent years a number of cases have been recorded. Especially of great interest is the report of Gerber of such a case in which salvarsan had such splendid effect, whereas other antiluetic measures had no effect.

Rerol[7] examined a case of this sort microscopically and demonstrated that most probably the process originated submucously.



Figs. 29-36.—Cicatricial formations.

TREATMENT

The most important, in fact the only rational treatment, is by means of the antispecifics, namely, mercury, especially in the early stages, and potassium iodid in the gummatous and later stages. It is not within the province of this paper to go into detail of the general treatment; besides, almost everyone is familiar with it. There is, however, something to be said in reference to the use of salvarsan in the affection of the larynx. In the very early forms of syphilitic laryngitis it has been found that the most brilliant results were obtained by giving salvarsan intravenously in large doses, and thus preventing further progress by further amplifying the treatment with mercury. The same is true of the early ulceration and great swelling of the mucous membrane where suppuration is threatening. This treatment was at first employed with great trepidation, because it was feared that there might result a swelling of the mucous membrane secondary to the use of salvarsan, the so-called Herxheimer reaction, which would necessitate a tracheotomy, but Gerger found in several cases that this was not so. I have had three such cases of early laryngeal syphilis with great obstruction to breathing, which responded most beautifully and without any untoward symptoms following the use of salvarsan. Again, as mentioned before, in the so-called parasyphilis of the larynx, or in those cases that do not respond to mercury and potassium iodid treatment, salvarsan often changes the condition so that mercury and potash do have beneficial effects. Since syphilitic laryngitis is usually not a painful affection, one need not employ any general remedies for relief. The local treatment may be divided into topical applications, semioperative and operative.

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[5] Dittrich: Prager Vitelgahrsch., 1850.
[6] Turck: In Atlas Taf., 23.
[7] Rerol: Thèse de Lyon, 1905, p. 58.

Beginning with the possibility of making a diagnosis of a primary chancre of the larynx, one may practice what the genito-urinary specialists have successfully done with chancre on the penis; this is to resect the chancre, especially if it be localized on the epiglottis. In the early stages of erythema, papules and condylomas, the local application of calomel or iodol insufflations are very agreeable, mild solutions of silver nitrate or argyrol, steam inhalation, and mild alkaline sprays, are also indicated, especially when the secretions are excessive. The rest to the voice is very beneficial. In the broken-down infiltrations or gummata, it is necessary frequently to cleanse the surfaces by laryngeal irrigations or swabs, followed by application of stronger solutions of silver nitrate or iodoglycerin solution. The same is true in the broken-down nodular and perichondritic type. When the concomitant edema is present then frequently multiple punctures of this edematous membrane give marked relief. In the severe forms of perichondritis with abscess formation pointing externally, an early incision externally will prevent further extension or greater embarrassment to breathing. In all forms of the later stages of laryngeal syphilis, when considerable swelling is present, one must be constantly watching for the possibility of having to perform a tracheotomy, and in very severe forms of dyspnea it is frequently better not to wait till the last moment, but do a tracheotomy beforehand.

The management of the end-results of the ulcerated forms of laryngeal syphilis will depend on the condition present. The direct method of laryngoscopy, especially by the aid of suspension, offers great aid in the treatment of multiform cicatricial deformities and obstructions. Incisions of bands and resections of cicatricial masses with subsequent dilatation, either by the old Schrotter's dilators, directly by Jackson's dilator or bougies, or the wearing of the new O'Dwyer tube, as recently recommended by Mayer and Jackson, will no doubt give very satisfactory results. If, however, the interior of the larynx be markedly obstructed, especially following severe forms of perichondritis, with abscess formation in which a greater portion of the cartilages have sloughed away, then a laryngostomy will give the only permanent relief.

DIAGNOSIS AND TREATMENT OF LARYNGEAL TUBERCULOSIS

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In discussing the subject of tuberculous laryngitis I take it that it is not expected that time shall be expended in dwelling on the more obvious and well-known forms of the affection, but that some of the things learned from experience in the earlier, less marked lesions would be more profitable.

Those practicing in a place like Colorado Springs where there are many consumptive patients, encounter more cases of larynx involvement than do those who work in communities in which consumptives are relatively few; and we thus have perhaps more opportunity to see and study these cases.

I think, however, that patients with pulmonary tuberculosis are not as a rule subjected to systematic laryngeal examination early enough or often enough even in health resorts and sanatoriums. If this is done, it results in the discovery of many cases of incipient disease of the larynx, and appropriate treatment may be instituted at a time when such treatment is most effectual. The doctrine that early diagnosis enhances the prospect of a favorable outcome of treatment is perhaps just as true in this disease as it is when we are dealing with lung tuberculosis.

DIAGNOSIS

At the outset, let us not forget that primary laryngeal tuberculosis is an exceedingly rare disease, and further that not every case of hoarseness or even laryngitis in a tuberculous patient is necessarily due to tuberculosis of the larynx. Tuberculous persons may have simple catarrhal laryngitis or syphilitic or cancerous disease of the larynx, and the differentiation is not always an easy matter, especially in the beginning.

Hoarseness, pain (spontaneous and on swallowing, and shooting up to the ears), infiltration and ulceration of a typical appearance are the classical signs and symptoms of tuberculous laryngitis, and need not be described here; but a patient may have the disease and not be hoarse, as for instance, in a case of slight ulceration of the epiglottis or some other part of the larynx not directly concerned in phonation. I do not refer to that peculiar quality of the voice which may be described as "weakness" (for lack of a better term) which practically all sufferers from pulmonary tuberculosis present. This is probably due to a lack of vigor of the muscles of phonation and is a part of the general muscular atony. It differs from the hoarseness of tuberculous laryngitis as much as does the raucous voice of a syphilitic larynx. I have in mind two cases, in one of which the lesion was confined to a small and atypical ulcer on the left wall of the interior of the larynx above the false cord; in the other, the left side of the tip of the epiglottis was ulcerated and a slight infiltration developed later. In the first case, absolutely no pain and only the slightest huskiness was complained of; in the second, no hoarseness but merely a sense of discomfort in the throat was observed.

Then the sign of pallor of the mucous membrane which is given in most text-books as one of the diagnostic features of laryngeal phthisis is from my observation a very unreliable index, for the color depends on the complexion of the patient and the hemoglobin content of the blood. Pallor has no significance in this connection unless localized in the throat. I am aware that this is not an original discovery of mine, but I cannot forget my disappointment and perplexity during my early experience in not finding it always.

A sign which has seemed to me to be so constantly present that I attach great importance to it is a thin line of mucopus which lies in the posterior commissure and extends up and over the top of the interarytenoid region. I have thought that this might be due to a localized inflammation or ulceration in the subglottic region. This is, of course, attended by other indications of laryngitis.

Redness of one cord, the appearance of the other remaining normal, is almost diagnostic of tuberculous laryngitis in a tuberculous person.

I have often noticed a slight infiltration of the epiglottis—not the characteristic enormous thickening, but a sort of clumsy-looking, blunt-edged organ in a larynx showing distinct but early signs elsewhere—which I have suspected may be a true tuberculous infiltration, though it has not always developed into the characteristic type.

In the differential diagnosis we must consider simple catarrhal laryngitis, pachydermia, syphilis, carcinoma and possibly posticus paralysis, rheumatic arthritis of the crico-aryteniod joint and laryngitis sicca.

As mentioned before, a tuberculous person may have a simple catarrhal laryngitis, and it may be impossible to say at first that it is not the beginning of a local tuberculous process. It is only by observing the further course of the disease as to whether or not the condition soon clears up that a correct opinion can be formed. Every affection of the larynx in a phthisical patient should be regarded with suspicion, and the case kept under close supervision. A laryngitis which does not clear up promptly should be regarded as probably tuberculous; later on the characteristic signs will be discovered in most cases.

A pachydermia of the posterior wall sometimes strikingly resembles the granulating edge of a tuberculous ulcer in this situation, and pachydermatous areas may also become infected with the Koch bacillus. The differentiation may be very difficult; but the finding of an ulcer either by inspection or by the presence of blood on a swab with which it has been wiped, together with the discovery of lung tuberculosis, will lead us along the right track. Typical tuberculosis in other parts may be required to establish a diagnosis.

In laryngitis sicca the crusts may adhere so tenaciously and look so much like a tuberculous deposit that it is not possible from appearances alone to make a diagnosis. Injection of warm water or oil and clearing of the larynx by coughing will nearly always remove them.

As between syphilis and tuberculosis the chances of error have been greatly reduced since the Wassermann reaction has been in vogue and salvarsan discovered. In this connection it should not be forgotten that a mixed lesion is present in many cases, and we should be on our guard in a case of either one that the presence of the other is not overlooked. I have notes of a case in which a diagnosis of tuberculous laryngitis was made in a woman with a history of pulmonary and hip-joint tuberculosis. Later a characteristic skin syphilide was discovered and under antiluetic treatment the larynx rapidly healed except in a comparatively small area, which remained obstinate. This was most probably a case of syphilis of the larynx on which a tuberculous infection was grafted. Moritz Schmidt reports a case in which tuberculosis, syphilis and carcinoma were all present in the larynx of the same patient.

The distinction between carcinoma and tuberculosis of the larynx, especially of the tumor form, offers difficulties at times. Lagging of the affected side on phonation in carcinoma, the appearance of the lesion sometimes, and the age of the patient help to differentiate it. A tuberculin test is of great value, particularly if the local reaction in the larynx is looked for. Microscopic examination of an extirpated piece is in most cases decisive.

Unilateral posticus paralysis occurring in a person with pulmonary tuberculosis might be mistaken for a tuberculous perichondritis of the arytenoid with ankylosis of the crico-arytenoid joint; but the tumefaction and infiltration of the tissues would be absent in the former affection.

Rheumatism of the crico-arytenoid joint is, in my experience, a rare occurrence, and would therefore not often be a factor in the differential diagnosis. Furthermore, in rheumatism we would expect to find other joints involved.

TREATMENT

I am a firm believer in the idea that laryngeal tuberculosis ought to be thoroughly and persistently treated. I have no patience with the view that it might just as well be left alone because occasionally a patient recovers spontaneously or because these patients are doomed any way. The results of Schmidt, Heryng and a host of others prove that much can be done by appropriate treatment to add brightness to the prognosis in these cases.

Of first importance in the treatment is the proper care of the lung condition, because it is almost axiomatic that with a progressive lung disease little improvement can be expected in the process in the larynx. Therefore appropriate climatic environment, and proper supervision of the patient's daily life, habits, food, sleep and rest are basic essentials, together with such other therapeutic measures as seem necessary. In this connection the care of the appetite and digestion is of supreme importance. It has been well said that one's chances for recovery depend on a sound stomach. Tuberculin in suitable cases is useful, although I have observed no direct beneficial effect on the throat from its use.

Cough is a source of much irritation to an inflamed larynx, and should be controlled as far as possible by the voluntary efforts of the patient and attention to the upper air-passages, and subdued, if necessary, by narcotics, such as heroin or codein; the deleterious effects of these drugs on the appetite and digestion must at the same time be kept constantly in mind.

Talking causes as much irritation to the larynx as coughing, and except in those cases in which the lesion is so situated as not to be affected by its movements when phonating, speech should, as a rule, be interdicted. There are patients, however, who seem not to be able to exist if they are put on a strict "silence cure." They are born with a "gift of gab," have no resources of entertainment within themselves and get blue and melancholy if kept away from associates. With such persons the physician must use sound discretion and permit a limited amount of speech—perhaps require them to converse in whispers. He must remember always that he is treating a human being and not regulating a piece of inanimate machinery.

The relief of painful swallowing is just as essential from the point of view of maintaining a high degree of nutrition. No matter how hungry the patient may be he is not going to take a sufficient quantity of food if the effort is accompanied by excruciating agony. The local application of analgesics such as orthoform or anesthesin, either in powder or emulsion, is very useful. When the pain arises from lesions below the epiglottis, alcohol injections of the superior laryngeal nerve in some cases give complete relief lasting sometimes for days. Pain due to ulceration of the epiglottis can be relieved by amputation of this structure as emphasized by Lockard.

A great number of remedies have been used as local applications for the cure of laryngitis, prominent among them being lactic acid, formaldehyd solution, trichloracetic acid, Lake's mixtures, etc. I suppose each of us tries out many of them and then settles down to a few which seem efficacious. For my part I have felt that I have had best results from the use of liquor formaldehydi and trichloracetic acid. The former is of most value in infiltrations, used in strength of from 3 to 10 per cent. and thoroughly rubbed in, while the latter is reserved for ulcerations, applied in saturated solution at intervals of from seven to ten days. Both of these drugs find their greatest field of usefulness in cases which are not suitable for surgical measures; that is, in patients with active tuberculosis who are running high temperatures, or who have extensive involvement of the larynx or those whose equilibrium is too much upset by the thought of "cutting." The application of sunlight or Roentgen rays directly into the larynx are measures with which I have not had experience, but which I do not believe offer much if any advantage over the local application of drugs. Freudenthal speaks rather enthusiastically of fulguration, but I have seen no reports of its effects other than his original article.

We now have to consider a branch of the therapy which I believe is in suitable cases the most valuable aid in combating this affection. I refer to surgical measures. Ever since Heryng and Moritz Schmidt, a quarter of a century ago, began advocating surgical treatment of laryngeal phthisis, there has been at no time a complete accord on this proposition; and yet those men consistently adhered to their contentions, and the results have justified their faith. I feel convinced from the experience I have had with it that in properly selected cases it is the one best method of local treatment. Let no one, however, regard this plan as being universally applicable in all cases. He who does so will inevitably come to grief. But given a case of not too extensive involvement, with a quiescent lung, with a temperature of not over 100—in short, a patient who exhibits a fair amount of resistance to the tuberculous invasion—and favorable results may be confidently expected together with a shortening of the time required to bring the results about. Isolated tuberculomas or vegetations, moderate infiltrations and ulcerations, especially in early cases, are particularly responsive to the curet, the laryngeal punch or the galvanocautery. I have many times seen a tuberculous infiltration and ulceration of the posterior wall, which had for weeks and months resisted the application of various pigments and escharotics, yield promptly to the use of the punch, followed by lactic or trichloracetic acid. The cautery point is of much service in massive infiltrations of the false cords when the use of the double curet is perhaps unsafe.

Surgery is sometimes indicated also as a palliative measure. I recall the case of a young girl who had extensive involvement of the larynx and whose dysphagia was so great that she refused absolutely to swallow anything, even water. She was doing badly in every way and seemed altogether an unsuitable case for surgical interference. The case was desperate, however, and with the hope of affording some relief, a quantity of the offending mass was removed. The result was most happy. The patient was able to swallow with comparative comfort, her general condition, in consequence of the improved nutrition, improved and, while the ultimate result of the case was never in doubt, the temporary relief was well worth while.

Many cases of laryngeal tuberculosis arise in far-advanced cases of phthisis in which the prognosis is absolutely bad; yet even in these unfortunate cases surgery has a place. For instance, in dysphagia from ulceration of the epiglottis, when amputation of this structure is often followed by the greatest relief. Lockard says that this operation is indicated in any case, however bad, simply as a method of relief from suffering. Tracheotomy and laryngofissure have been advocated as curative measures, although they seem to be too heroic to be adopted in any but a small minority of cases. Still there can be no doubt that tracheotomy does often exert a favorable influence on the disease by putting the larynx at rest. As an illustration, I refer to the following case: I performed a tracheotomy four years ago on a young man who had for several years been suffering with lung tuberculosis and whose larynx was quite extensively involved. As a result of increasing and extreme stenosis the tracheal opening was necessary to prevent suffocation. Neither his regular attendant nor I expected him to live three months. He disappeared from observation shortly afterward and I thought he had gone to his reward. Much to my surprise he walked into my office two years later with his larynx perfectly healed and with a good but slightly husky voice. He is still alive and his larynx remains well, although he will in all probability eventually succumb to the disease in his chest, which is quite extensive.

CONCLUSIONS

1. Sufferers from tuberculosis should have their throats examined early and often, and persistent vigorous treatment should be instituted at the beginning of trouble in the larynx.

2. Proper attention to the general condition is one of the prime essentials.

3. Surgical intervention in appropriate cases offers by far the best prospect of permanent relief, and not infrequently is of much value as a palliative measure.

The Colchester.

DIAGNOSIS AND TREATMENT OF PARALYSIS OF THE VOCAL CORDS

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In the diagnosis of laryngeal paralysis, one must remember the normal functions of the muscles and their nerve-supply. There are four pairs of muscles on each side which act alike and one single muscle acting on both sides at once. These are supplied by two pairs of nerves, the superior and the inferior or recurrent laryngeal nerves. Remember, the superior laryngeal nerve supplies all of the motor muscles on the outside of the larynx, consisting of just one pair, and sends no motor filaments to any other muscle. It is the sensory nerve for the whole laryngeal mucosa. All of the other laryngeal muscles are supplied by the purely motor recurrent laryngeal nerves.

The external (cricothyroid) muscle, which is supplied by the superior laryngeal nerve, regulates the tension of the cords and it is very rarely paralyzed. Paralysis of sensation is always due to involvement of the same nerve. Nearly all cases of paralysis of the vocal cords, and every case in which the outward and inward movements of the cords are interfered with, fall within the domain of the recurrent nerves.

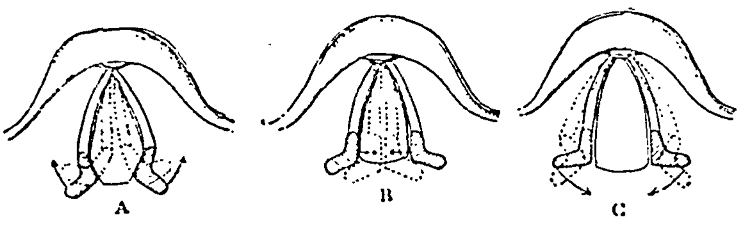
The muscles supplied by the latter nerve may be grouped as abductors and adductors. The crico-arytenoideus posticus on each side is the only muscle concerned in abductor paralysis; therefore, all of the others, that is the crico-arytenoidei-laterales and the arytenoideus are adductors; the thyro-arytenoidei are also adductors, but their main function is to make the cords tense.[1]

St. Clair Thompson's diagrammatic illustrations (*A*, *B* and *C*, Fig. 1), aid greatly in a clear conception of the function of the various muscles. In the typical normal larynx the edges of the vocal cords are brought together in a straight line in phonation; on quiet inspiration they are separated at the widest part about 7 or 8 mm.; on deep inspiration they are separated about 10 or 11 mm. In the cadaveric position they remain separated about 3 or 4 mm.

Exclusive of ankylosis, if the vocal cord cannot be drawn to the mesial line, there is paralysis of its adductor muscles. If a cord cannot be drawn away from the mesial line, there is paralysis of the abductors; if it cannot be drawn farther from the mesial line than the position of quiet inspiration, there is paresis, or partial paralysis, of the abductors; but if it can be drawn to the position of deep respiration, the abductors cannot be involved.

If a cord on respiration or attempted phonation remains in cadaveric position (about 2 mm. from the mesial line), then both its abductor and adductor muscles are paralyzed.

According to Semon's law, in organic paralysis of the laryngeal muscles, the abductors are always first involved; therefore, if the cord cannot be drawn outward beyond the position of quiet inspiration, we may conclude that it is the beginning of what will before long develop into complete paralysis.



Action of intrinsic muscles of the larynx. *A*. The arrows indicate the direction of action of the crico-arytenoideus lateralis, and the dotted lines show the positions to which its contraction brings the cords and vocal processes. *B*. The arrows indicate the direction of action of the interarytenoideus muscle, and the dotted lines show the positions of the cords and vocal processes on its contraction. *C*. The arrows indicate the direction in which the crico-arytenoideus posticus muscle contracts, bringing the cords and vocal processes into the positions indicated by the dotted lines.

PARALYSIS OF THE CRICOTHYROID MUSCLE

As this is the rarest of all forms of laryngeal paralysis and the only one in the domain of the superior laryngeal nerve, it will be considered first.

Causes, Etc.—This paralysis is associated with paralysis of sensation and may be caused by operations, by pressure on the nerve, or much more commonly by diphtheria. When this muscle fails to act the thyroid cannot be fixed on the cricoid cartilage and therefore, for want of a point of resistance, the vocal cord cannot be put on a stretch, and its edge will remain flabby, with a wavy outline, and will be blown upward in expiration and sucked downward in inspiration. In unilateral paralysis the cord appears shortened and smaller than normal, and it may disappear under the ventricular band in respiration. Paralysis of both cords gives a wavy outline of the glottis. The finger placed over the cricothyroid muscle may detect the feebleness of its action. The voice is feeble and cracked and tires easily.

Treatment.—As anesthesia of the larynx is likely to be present in these cases, care must be exercised to prevent food from entering the trachea. This can usually be avoided by feeding soft solids with the head well below the level of the body; or by feeding only fluids passed through a stomach-tube. If the tube is employed one should make sure that it has not been passed into the larynx, by causing the patient to phonate, before any fluid is introduced. Faradization has been recommended, but carefully watched large and increasing doses of some preparation of nux vomica or its derivatives will be found most beneficial. The tincture of nux vomica appears to me to give the most satisfaction.

PARALYSIS OF THE ABDUCTORS OF THE VOCAL CORDS (THE CRICO-ARYTENOIDEUS POSTICUS)

This being the only abductor of the cords, memory will be aided by considering it at this time. The affection just considered is probably the rarest, but this is the commonest of organic paralyses of the cords. It is caused by (1) bulbar lesions; (2) lesions of the vagus or recurrent laryngeal nerve; (3) peripheral neuritis and (4) inflammation of the muscles.

1. *Bulbar Lesions.*—As a cause these lesions are infrequent, but may occur from thrombus, embolus, or local aneurysm; from syphilis, tumors or abscess; from diphtheria, general paralysis, locomotor ataxia (bulbar) and very rarely from some other cerebral lesions.

2. *Vagus or Recurrent Lesions.*—These lesions are the usual causes of this affection and the most common of these are pressure from aneurysm of the arch of the aorta, or pressure as in goiter; also mediastinal tumors, aneurysms of some of the aortic branches, and enlarged bronchial lymph-nodes; cancer of the esophagus and operative accidents to the vagus or recurrent nerve. Conditions said to have caused it are pleural thickening at the apex, especially of the right lung, or large pleuritic effusions and, possibly, growths at the base of the brain involving the vagus close to its exit from the skull; aneurysm of the internal carotid, or abscess in the neck, and possibly pericarditis or dilatation of the left auricle involving the left recurrent nerve.

3. *Peripheral Neuritis.*—This may result from various mineral or vegetable poisons of which lead is far the most frequent, and very rarely from the toxins of certain infectious diseases as diphtheria, typhoid, influenza and rheumatic fever. Among the exceptional causes are typhus, pneumonia, gonorrhea and erysipelas.

4. *Inflammation and Infiltration of the Muscle.*—This may occasionally cause this trouble in cancer and exceptionally in injuries from foreign bodies and in syphilis or tuberculosis.

Symptoms and Signs.—Usually there is alteration of the voice and more or less dyspnea; the dyspnea becoming serious if both muscles are involved; sometimes, however, the patient notices no laryngeal symptoms.

UNILATERAL ABDUCTOR PARALYSIS (CRICO-ARYTENOIDEUS POSTICUS)

When partial, this condition merely prevents complete abduction of the cord, but when it is complete, the unopposed action of the adductors draws the cord to the mesial line and the tensors keep its edge straight so that the voice may not be affected and, if it comes on slowly, the patient may not notice any dyspnea. If there is dyspnea some cause should be sought below the glottis. In advanced cases, except those purely myopathic, the adductors also become involved and then the cord remains in the cadaveric position if the paralysis is complete, or, when there is only paresis, in the position of quiet inspiration, in which case the cord appears relaxed, its edge concave and its surface narrow.

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[1] It is generally accepted that the thyro-arytenoidei act mainly as tensors of the cords, but the function of the thyro-arytenoidei externi is very uncertain. That these would compress the ventricle appears certain, but their action on the cords, if any, is unknown. It appears to me that these muscles have an important function as adductors of the ventricular bands in closing the larynx against the entrance of foreign bodies; and occasionally in supplementing the action of the true cords.

The condition may not be recognized in quiet respiration; but in deep inspiration the cord does not abduct as far as its fellow. If the adductors are also involved, as is usual, it is not drawn to the middle line in phonation, while the sound cord is likely to pass beyond the middle line; thus the voice may remain good although it is usually cracked. The arytenoid either remains motionless or is pushed over by the movement of the sound side. The voice is likely to improve with time because of compensatory action of the sound side. Grünwald says that frequently there is twitching of the affected arytenoid cartilage due to contraction of the interarytenoid muscle which is innervated partly from the opposite side. If this twitching is present it at once excludes ankylosis.

BILATERAL ABDUCTOR PARALYSIS (CRICO-ARYTENOIDEI POSTICI)

This is not so common as the affection of one side only. When partial, as it usually is in the beginning, the cords are separated a little way on deep inspiration so that respiration may not be greatly interfered with and phonation may remain normal; but when complete, unless the adductors are also paralyzed, the cords remain in apposition and dyspnea becomes so urgent as to demand intubation or tracheotomy. In this condition the cords appear to be sucked closer together on inspiration, but the voice may be fairly good. When the adductors are also completely paralyzed the cords remain in the cadaveric position and respiration is not so much impeded. All patients with bilateral abductor paralysis are subject to sudden and dangerous attacks of dyspnea.

Diagnosis.—This can generally be easily made on inspection by observing the foregoing points, but there is sometimes much difficulty in distinguishing this condition from ankylosis. Differential diagnosis between these two rests on the following points: A history of inflammation with swelling and induration without evidence of nervous origin is usual in ankylosis; not so in paralysis. The arytenoid cartilage is not pushed over by its fellow in ankylosis on phonation as it often is in paralysis. Any movement of the cord is incomplete, or the cord is quite immobile even with the probe and it may be in an unusual position in ankylosis. In paralysis there may be twitching of the arytenoid inward by the interarytenoideus muscle; the cord, early in the affection, is likely to be in the mesial line, but, later, in the cadaveric position and it is movable with the probe.

Treatment.—If the history points to an origin in syphilis, lead-poisoning or tuberculosis, appropriate general treatment should be adopted. In other cases strychnin in gradually increasing doses to the physiologic limit should be tried thoroughly. The spasmodic dyspnea may sometimes be relieved by the administration of bromids or antipyrin or by inhalation of amyl nitrite.

For the relief of the dyspnea resulting from inability of the abductors to open the glottis it has been proposed to excise the cords, but the results are not good. Intubation may give temporary relief, but unless the affection soon yields to treatment tracheotomy must be done. A tube with cap and valve will allow the patient to breathe and also to use his voice. If due to goiter, removal of the isthmus will usually give relief, but if the gland is large a considerable portion of it should be removed.

ORGANIC ADDUCTOR PARALYSIS

This affection of the vocal cords is a sequel of and due to the same causes and requires the same general treatment as abductor paralysis. The appearances caused by this affection will be the same as those in functional paralysis, which will be described below.

PARALYSIS OF THE ADDUCTORS OF THE VOCAL CORDS

This includes paralysis of the crico-arytenoidei laterales, the interarytenoideus and the thyro-arytenoidei.

Unilateral Paralysis of the Crico-Arytenoideus Lateralis.—This is extremely rare and is due to local causes. If it were only partial the cord would approximate the mesial line more or less in phonation and might remain as in quiet respiration, moving slightly in respiration and phonation. If complete, the cord would be drawn outward to the limit of the abductor muscle, giving it a concave border as in deep inspiration. This paralysis is sometimes produced by acute catarrhal laryngitis. I have seen at least three cases of this kind; but the affection has also been attributed to lead-poisoning, syphilis, typhoid and small-pox.

Diagnosis and Treatment.—Having excluded ankylosis of the arytenoid the position of the cord at the side of the larynx in attempted phonation would establish the diagnosis. Treatment should be directed to the cause and strychnin may be very useful.

Bilateral Adductor Paralysis of the Crico-Arytenoidei Laterales.—When of organic origin this results from inability of the recurrent laryngeal nerve, or the vagus from which it is given off, to transmit motor impulses to these muscles. It is due to the same causes as abductor paralysis, with which it occurs in the later part of all distinct manifestations. The proper treatment has already been indicated. The diagnosis rests on the history and the same appearances as shown in functional affections.

FUNCTIONAL ADDUCTOR PARALYSIS

This affection is known also as functional aphonia and nervous or hysterical aphonia. Nearly all cases of this affection are hysterical, but myopathic causes may sometimes be found. They result from acute catarrhal inflammation or straining of the voice and cases have been attributed, exceptionally, to lead, arsenic, phosphorus or copper poisoning and very rarely to syphilis, tuberculosis, typhoid, etc.

The affection comes on suddenly and may be brought about by any of the many exciting causes of hysterical attacks. Often there is a history of previous attacks. The speech is reduced to a whisper and in very aggravated cases may even be lost. There will be no resultant cough or dysphagia and no pain or evidence of constitutional disease except common symptoms of anemia, neurasthenia and debility which are often present. In cases resulting from debility the symptoms come on more gradually, the voice possibly being weak for several days before it is lost.

Diagnosis.—Usually the cords are found in the position of quiet respiration, but they will be still further drawn apart on deep inspiration. On attempted phonation they are not brought much nearer together than the cadaveric position, although they may be fully approximated for an instant to separate again before any sound is emitted.

Often the laryngoscopic examination alone is sufficient to cause approximation of the cords when the patient is asked to phonate; but if the patient does not respond to the request to say *A* she should be induced to laugh or cough. Usually the application of a slightly astringent spray as the patient attempts to phonate will bring the cords together at once and the cure will have begun. Whenever in such a case the cords are seen to approximate closely, whatever means may have been employed, the diagnosis of functional paralysis is established.

Treatment.—Measures appropriate to the cause should be instituted and generally a few applications of a mild astringent as zinc sulphate, 2 grains to the ounce, will aid in the cure. Nothing in my experience, however, has equaled strychnin in regular and increasing doses until the result is accomplished. I usually begin with 1/30 grain three times a day and gradually increase it until sometimes I give as much as ⅛ grain three times a day. The patient should be informed of the probable physiologic effects and directed to reduce the dose as soon as muscular spasms occur. The remedy should be continued in doses just below those causing toxic symptoms until recovery is complete. Thompson advises encouraging the use of the voice in reading aloud, talking and singing and especially advises avoidance of the use of electricity, as the latter is so uncomfortable that the patient is liable not to return for any treatment in case of a relapse.

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Persevering use of the faradic current is also recommended and strychnin should be tried thoroughly.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. MAYER, BECK, DENNIS AND INGALS

DR. THOMAS HUBBARD, Toledo, Ohio: Intratracheal injection is useful as an aid to direct treatment of chronic laryngitis. It is usually essential to reach the whole laryngotracheobronchial tract. The use of the syringe has not been generally satisfactory because the instruments on the market are not practical. I use a cannula with a very short curve and make no attempt to introduce it into or beyond the glottis; in fact, I do not even touch the epiglottis. Under the guidance of the throat-mirror it is easy to drop medicated solutions through the glottis without causing any irritation and thereby reach the lower part of the tract and treat it without irritation of the larynx. The larynx is thus thoroughly cleansed from below upward. I have simplified the operation somewhat in certain cases in which it was desirable that the operator should hold or depress the tongue. For these the mirror is attached to the cannula. The syringe should have a capacity of about 16 gm. (4 dr.). The ordinary glass syringe will do. You can pack with asbestos to secure easy, smooth action. This kind of syringe can readily be sterilized by boiling.

A pure mineral oil is the best menstruum in the treatment of these conditions. The oil should be tested with iodin crystals, which produce a permanent cherry-red color. In impure oil the color fades in a few days. Menthol and guaiacol, 3 per cent., in Russian petroleum oil, or weak solutions of iodin can be used in quantities varying from 4 gm. to 8 or even 12 gm., depending on indications. Subacute and chronic laryngitis is very often complicated and occasionally caused by bronchitis or tracheitis. Treatment should be directed toward removal of such complication or cause, and I consider intratracheal injections highly efficient if proper attention is given to indications and technical detail.

DR. LEROY S. PETERS, Silver City, N. M.: In the New Mexico Cottage Sanatorium we treat many cases of tuberculosis of the larynx. Fifteen years ago the cases presenting laryngeal complications were considered fatal. I think that this was due to a lack of early diagnosis. In laryngeal, as in other cases, an early diagnosis enables us to get better results in our treatment.

Dr. Dennis' point with reference to the paleness of the larynx as a diagnostic sign is well taken. Seldom do we see in our routine examinations a pale larynx, but, on the other hand, they are highly red and inflamed. The tuberculin test may be valuable in establishing an early diagnosis by causing a local reaction, although, as a rule, in giving tuberculin therapeutically when a slight reaction arises we see very little change, if any, in the larynx.

In making a differential diagnosis between tuberculosis of the larynx and other diseases, syphilis causes us more difficulty than any other disease. Let me cite a case that I had under observation. The patient was in good physical condition, was of normal weight, but was running a temperature of 103 F. He had a bilateral apical lesion with an involvement of the larynx from the base to the upper part of the pharynx. I made a tentative diagnosis of syphilis. Two doses of salvarsan were administered, however, in one week and I was unable to influence the course of the disease in the larynx. A Wassermann test proved negative. After the salvarsan injections the patient began to lose strength and in two weeks was dead. That man probably had a rapid type of laryngeal tuberculosis, although the diagnosis proved difficult.

I commend the attitude taken by Dr. Dennis as to the treatment of laryngeal tuberculosis, against the stand laid down by so many that these cases are as well let alone. The results obtained in sanatoriums may be partly due to the rigid régime prescribed for the patient. However, the local applications that are made to the throat twice daily in our routine work are, we believe, responsible for the large percentage of cures we have in this class of cases. We use tuberculin therapeutically believing that it is as good in laryngeal tuberculosis as in the pulmonary form.

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DR. MICHAEL P. SCHUSTER, El Paso, Tex.: The supervision of these tuberculous cases by the laryngologist is important. There are hundreds of sanatoriums that have not sufficiently controlled the laryngeal conditions in tuberculosis. Almost every tuberculous patient has something the matter with the larynx. In the beginning of this disease, in many cases, the laryngeal treatment is all that is needed. The cough is controlled and the patient can live more comfortably; often it is the tuberculosis of the larynx that kills and not the tuberculosis of the lungs.

In the differential diagnosis between tuberculosis of the larynx and syphilis of the larynx, there is one point which has always been a help to me and which has always seemed to point to a correct diagnosis, namely, that in all cases of tuberculous laryngitis there was extreme sensitiveness to touch, while in syphilitic laryngitis this was not the case; sometimes I have even thought that the parts were almost anesthetic.

I have not found salvarsan to be of any help in the treatment of syphilitic laryngitis. The cough should be relieved. It has been estimated that the blast of air passing through the larynx in an attack of coughing goes at the rate of two miles a minute and this, of course, must cause much friction in the larynx. In many patients training will accomplish much. Sometimes if they cough but once in the morning they will be comfortable the remainder of the twenty-four hours. Should these cases be treated locally or not? There are two groups of cases, those which are sensitive and will react and those which will not react; those that react should be left alone so far as any local treatment is concerned.

Dr. Howard F. Pyfer, Norristown, Pa.: What is the value of high altitudes, dry air and continuously sunshiny days in these tuberculous conditions of the larynx? Are we justified in sending our patients to distant states, New Mexico, Texas or Colorado, far from home and its comforts and care? Are the advantages commensurate with the annoyances and irritations?

Dr. Cullen F. Welty, San Francisco: I wish to emphasize what has been said about pain. This pain is best relieved by injections of alcohol, followed by the proper intralaryngeal operative procedure. Some of my colleagues in San Francisco have used the alcohol injections in a series of cases and comment on it very favorably. The most important thing, however, in laryngeal tuberculosis, is to keep the patients eating all the time.

We should operate for a cure (a) in all cases of primary tuberculosis of the larynx, unqualifiedly; (b) in cases of laryngeal tuberculosis, in which the patients are not losing weight, and do not have a temperature of more than 100 F., that is, in cases in which the lung tuberculosis is more or less quiesent. In some few instances, this operative interference seems to light up a new infection which is, of course, serious. We should operate for the relief of distressing symptoms such as pain, etc.; many patients can be made quite comfortable for at least the remainder of their lives by the proper operative interference.

Dr. J. Holinger, Chicago: Chronic laryngitis, described by Dr. Mayer, is a difficult proposition. The erosions which extend over the pharynx and larynx often baffle all attempts at a cure. Several cases which I have followed for many months turned out to be carcinoma, yet in the beginning there were no indications of malignancy. One case of gumma of the larynx was of personal interest to me. A man, aged 40, had not been able to sleep for many nights on account of difficulty in breathing. He came to me in an exhausted condition. His voice was almost inaudible. An examination being impossible, I intubated, after which he slept for fourteen hours. When he awakened he coughed out the tube. It was replaced and he slept for another ten hours. He was then examined and a tumor was found on the arytenoid surface which almost completely filled the larynx. The mucous membrane covering it was normal. The diagnosis of gumma was corroborated by Dr. Louis E. Schmidt from a scar on the penis and swollen glands in all characteristic places. Specific treatment was instituted, and at once I had difficulties to contend with. The patient was utterly unscrupulous, disregarded all advice and recognized no law and no opinion but his own. From the beginning he staunchly denied the syphilitic nature of the disease and only reluctantly took antisyphilitic treatment. Against my advice he continued to chew tobacco and smoke, and as a consequence I could not push the mercury. After one week his teeth became loose. He was intubated regularly for several weeks. Repeatedly when the tube came out the interns tried to reintroduce it; other colleagues tried also. Soon the interns refused to treat the patient, because during one of these intubations he gave one of them a blow in the stomach. One evening I could not reach his bedside until an hour had elapsed after the tube came out. I found him unconscious, with shallow, irregular respiration. Owing to the great distances in Chicago, and the possible irregularity of the telephone, I could not carry the responsibility any longer, and insisted on tracheotomy, but he refused. After several days, however, when the alternative was put to him, either to leave the hospital and engage another physician, or to consent to the operation, he reluctantly submitted. Afterward he was sulky because he could not talk at all. In the spring he went to Arkansas, whence he returned much improved in his general condition and wanted the tracheotomy tube removed. By laryngofissure, I removed the gumma submucously. The result was perfect. One could see only a small scar in the anterior wall of the larynx. After the operation, I found that, owing to the vocal cords being totally paralyzed he could not breathe without the tracheotomy tube. I proposed either to wait for a possible recovery of the motility of the cords, or to excise the cords. He then disappeared and I did not hear from him again until five months later, when he came into my office, pulled out a pistol and committed suicide. He was a professional slugger for the plumbers' union.

Dr. Burt R. Shurly, Detroit: It seems to me that the point made that we should have a laryngologist in every hospital devoted to tuberculosis (and we seldom hear of an attending laryngologist) is a timely one. There are a few sanatoriums in this country in which it is recognized that the use of the knowledge of a laryngologist is worth while. It seems to me that this study of the larynx is essential. The older laryngologists were laryngologists in every sense of the word. There is a danger that we may wander from this interesting field. I have seen a large number of cases of laryngeal tuberculosis and have sent these patients for climatic treatment to those who were particularly interested in this disease. In looking up the statistics of patients who have been under observation for seventeen years I find that 96 per cent. of those with incipient cases are alive and well to-day. I have never reported that record because I do not believe that such a report is valuable until patients remain alive and well for periods of at least from five to ten years; for we know what an arrested case is, and we know what may occur from day to day and from year to year. The laryngologist has a definite procedure in the treatment of this particular class of cases.

I do not believe that the internist should tell us how to treat syphilitic laryngitis. He should not tell us when to take the tonsils out. These questions belong to our particular domain. Our knowledge should be so definitely perfected that the internists would come to us and ask us how to treat the larynx.

Dr. Elmer L. Kenyon, Chicago: In the routine examination of several hundred patients at the Edward Sanatorium for tuberculosis, I have been struck with the frequency of the occurrence of enlargement of the soft tissues in the region of the posterior commissure of the larynx and of the aryteno-epiglottic folds. I formerly considered such swellings of grave tuberculous importance. And so they may be. Apparently, however, the pathology in these cases is not always the same. In these relatively early cases of pulmonary tuberculosis probably 50 per cent. show swelling of this character and yet the larynx in a large percentage of these cases gives no trouble and the patient recovers. The local irritation arising from outdoor living in cold weather may account in part for the condition, and I also think it possible that the secretions from the lungs sticking in the laryngeal region may produce irritation of the mucous membrane and cause laryngeal efforts at expulsion, resulting in local edema. At any rate, many of respond to the request to say *A* she should be induced to laugh or cough. Usually the application of a slightly astringent spray as the patient attempts to phonate will bring the cords together at once and the cure will have begun. Whenever in such a case the cords are seen to approximate closely, whatever means may have been employed, the diagnosis of functional paralysis is established.

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THE RESULTS OF TONSILLECTOMY UNDER LOCAL ANESTHESIA. NEW OPERATION *

BRYAN D. SHEEDY, M.D.
NEW YORK

It seems to me wholly unnecessary to give a long introduction to this subject in speaking before specialists who have been for years following this special work. I know that every man here has removed tonsils time and time again, under local or general anesthesia or with no anesthesia, with what he considered satisfactory results to both himself and his patients.

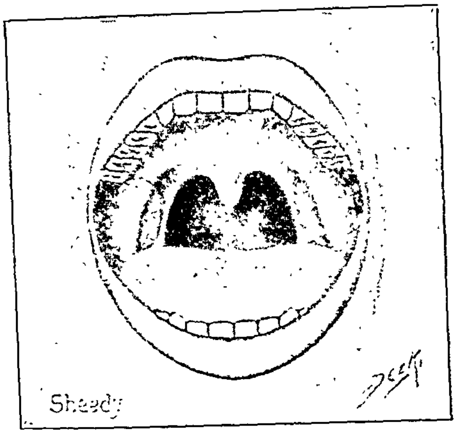

Fig. 1.—Normal tonsils.

The length of time that has passed since a given operation is an important consideration in examining throats as to the results found following tonsil enucleation, so I desire to state that in all of the cases reported operation was performed not less than three months before examination and that in no patient under 14 years of age was local anesthesia employed. I have not separated into groups patients in whom the tonsils were enucleated under local anesthesia in contradistinction to general anesthesia or no anesthesia.

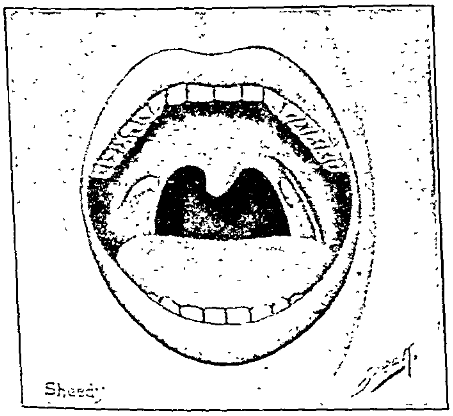

Fig. 2.—Right anterior pillar gone; scar tissue on posterior; contraction of posterior pillar; large mass of scar tissue where left anterior pillar should be.

To introduce the discussion I shall report the results of examination of 100 patients on whom tonsil enucleation was performed by some one of the methods now in vogue, these examinations having been made at my clinic and in my private work during the past eight to ten months. There have been some of the operations performed in almost every public institution in New York City and Brooklyn and hardly a man of prominence in those institutions was omitted from the list of operators, though a fair percentage of the patients were operated on by men with only limited training and experience.

The results of tonsil enucleation, that is the removal of the tonsil with its capsule complete (tonsillectomy), are, I believe, so far as removing diseased tonsils is concerned, very much better than the results obtained from the old tonsillotomy procedure by which only a portion of the gland and capsule was removed. Though we now have many throat deformities and defects following the newer method the constitutional benefits derived from the procedure are, I believe, far greater than and outweigh the drawbacks following the work, as shown by throat deformities with singing and voice defects. There is no doubt in my mind but that many of the physical throat deformities are due to the present clumsy and non-surgical methods employed in the removal of the gland, so if a single case of deformity is prevented by the "eversion operation," as a result of this discussion, I shall feel repaid for digressing from my text for its introduction. To emphasize the points necessary to an understanding of complete local anesthesia, as well as the removal of the tonsil by the "eversion method," your minds must be clear on the anatomic make-up of the gland and its surroundings. Therefore, I shall briefly outline to you the anatomy of the parts, quoting liberally from the subject as presented before this Section by one of our esteemed confrères on a former occasion.

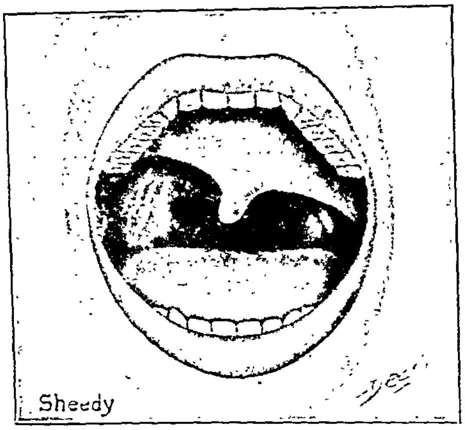

Fig. 3.—Complete absence of both pillars on right side with soft palate drawn up; absence of left posterior pillar with marked contraction of left anterior pillar; large masses of scar tissue where pillars were located; space between soft palate and pharyngeal wall very much limited.

ANATOMY OF THE STRUCTURES

Whether the tonsil should be called a gland or the gland a tonsil, or whether it should be designated simply as lymphoid tissue or given some other name, will not concern us in this discussion. I shall use the terms interchangeably and consider the tonsil a mass of glandular tissue located between the anterior and posterior pillars, but quite independent of them when in a normal condition. The outer wall of the bed on which the tonsil rests is, as you know, made up of the superior constrictor of the pharynx over which there is a thin layer of connective tissue.

The gland, we are told, first appears at the fourth month of intrauterine life and reaches its fullest development at from 5 to 7 years of age, at which time it begins

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* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

to atrophy and, if it has not been diseased, should have wholly disappeared by the time the child is 15 years old. This gland is only a part of the lymphoid tissue derived from the hypoblast and it is important that we should keep this matter in mind; as too many physicians are inclined to consider disease of the faucial tonsils a local one without bearing in mind that the mass in the nasopharynx, which is called adenoids, or that found at the base of the tongue, described as the lingual tonsil, or the glandular tissue in the crypts of Morgagni, or the peptic glands of the stomach, or the lymphatic structures of the duodenum, or the mass going to form Peyer's patches, or that so often filling the appendix, are lymphoid structures and all derived from the hypoblast, so that when there is a tendency to hypertrophy and abnormality of one portion of the lymph structure, we should keep in mind the possibility of abnormality of all parts in which hypoblastic formations are found.

The tonsil, we are told, is wholly covered by the plica tonsillaris before birth, but shortly after birth the membrane disappears from that part of the gland afterward exposed in the oropharynx. The remainder of the gland is surrounded by a dense layer of connective tissue, generally described as the capsule. Therefore, the capsule extends around all of the gland, except that portion opening into the throat. We find on the inner side of this capsule bands of connective tissue extending from one side of the capsule to the other, and, suspended on this connective tissue, we find the glandular structures. Leading into the tonsil from the space over which there is no capsule are several openings, according to the size of the gland, which we call crypts or lacunae, and we find that the mucous membrane covering the pharynx extends over the pillars and into these pockets and, through its adherence to the surrounding structures, helps to hold the tonsil in position.

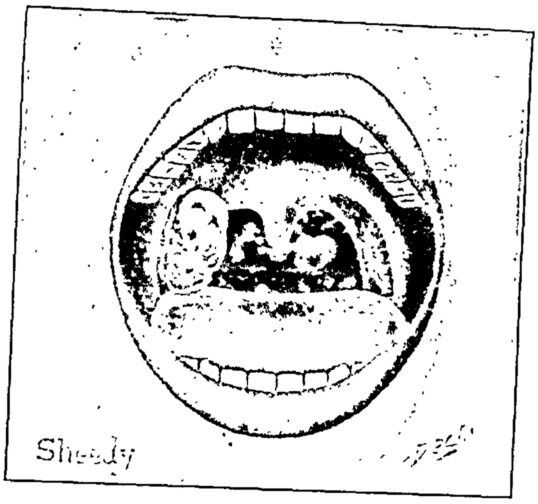

Fig. 4.—Tonsil everted through hypertrophy of its structure.

When we examine more carefully the tissues surrounding this gland, we find that the anterior pillar is formed by the muscle, which runs from the soft palate to the base of the tongue, the palatoglossus muscle. The action of this muscle constricts the opening between the mouth and the pharynx and is concerned with the position of the soft palate in the act of swallowing and talking. Frequently inflammatory adhesions are found between this muscle and the tonsil. This muscle, when the tonsil is not very large, is rather thick and appears conspicuously, in the act of gagging or when the tongue is brought forward, through the mucous membrane covering it. When the gland has been hypertrophied for a great length of time we find this muscle, or in other words the anterior pillar, very thin with only a few shreds of the former muscular tissue remaining.

Posterior Pillar.—The posterior pillar is also made up of a muscle, which runs from the soft palate above to the pharyngeal wall behind, where a portion is inserted into the aponeurosis; while another, and the principal part, passes forward and is inserted into the thyroid cartilage. This muscle has much to do with properly locating the larynx during the act of singing. The combined action of the pillars on the right and left side of the throat with the pad of Passavant, almost, if not completely, shuts off the mouth from the upper respiratory tract. The membrane of the pharynx extends over the posterior pillar the same as over the anterior pillar, holding the gland in position.

Supratonsillar Fossa.—The tonsil bed between the two pillars and above the superior surface of the tonsil, when in normal position, is generally described as the supratonsillar fossa and is covered by the same mucous membrane that covers the tonsil. In this space we find openings leading into the cellular tissues on which the tonsil rests and in which we have suppuration in cases of peritonsillar abscess. It is important at this point to remember that there are one or two crypts in the top of nearly every tonsil, which open into this space and which are frequently the cause of infectious material getting into the sinuses leading to the cellular tissue and causing peritonsillar abscess.

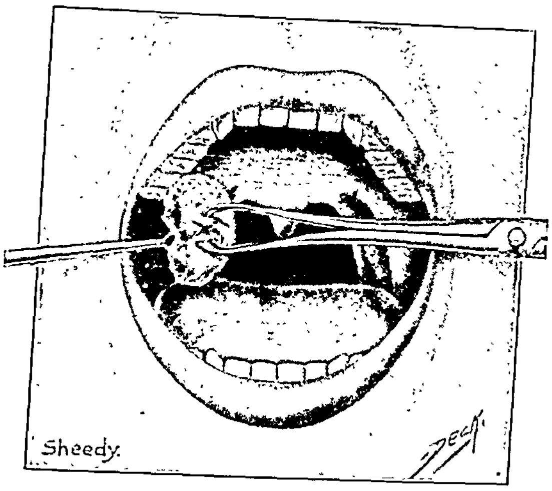

Fig. 5.—Tonsil everted. Snare in position.

Tonsil Bed.—That portion of the tonsillar fossa actually occupied by the gland rests against the superior constrictor muscle of the pharynx, but between the muscle and the capsule is a layer of cellular tissue so that there is a layer of cellular tissue all around outside the capsule and between it and the muscles surrounding the tonsil. This is the tissue in which local anesthetics should be placed when the tonsil is removed under local anesthesia, so that the gland really rests on a mass of cellular tissue infiltrated with the solution used to bring about the anesthesia. As we look at the bed of the tonsil we find three large arteries leading to the gland: (1) the tonsillar artery, a branch of the external maxillary; (2) the ascending pharyngeal, which is a branch of the external carotid, and (3) the descending palatine. There are several smaller branches, but the three enumerated are the ones we should have in mind in dealing with hemorrhage. It is well to remember, too, that in a large hypertrophied tonsil all the blood-vessels are enlarged and, therefore, many of the smaller vessels become very prominent. Without taking up too much time emphasizing the anatomic relationship of the tonsil, I want to impress on you the outline of the pharyngomaxillary space, which lies behind and outside the tonsil and in which there is a large amount of cellular tissue and in which kidney-shaped space the blood-vessels are found and in which we have the accumulated pus in peritonsillar abscess. The shape and location of this pharyngomaxillary space indicates why we should open our peritonsillar abscesses at the point midway between the base of the uvula and the last molar tooth, where the space comes nearest the surface. The anatomic relationship between the blood-vessels and this space also explains the serious hemorrhages that we frequently have in peritonsillar abscesses. As the nerves are found with the blood-vessels it is readily appreciated that if this cellular tissue is infiltrated with a watery solution there will be a minimum amount of pain in the removal of the tonsil.

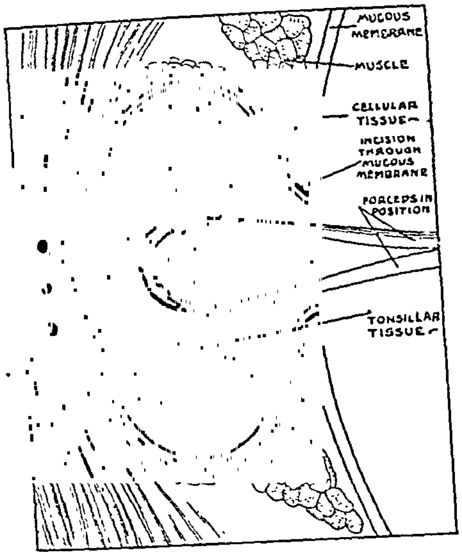

Fig. 6.—Position of forceps before traction is applied on tonsil in eversion operation.

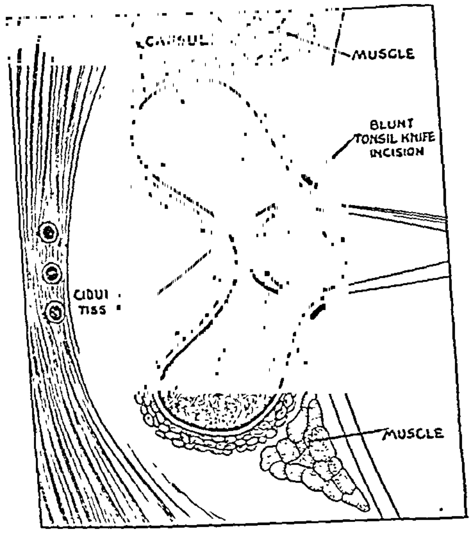

Fig. 7.—Tonsil everting.

After this review of the anatomy of the parts we are prepared to discuss the various forms of operation for the removal of the gland that have been in vogue for some time past. Without going into the matter too much in detail, I would say that the aim in all the tonsillectomy operations has been the complete removal of the gland with its capsule and this has been accomplished (1) by taking hold of the gland with a pair of tonsil forceps and pulling the whole gland from its bed, dissecting away with sharp knives or scissors the mucous membrane and cellular tissue; (2) by making an incision through the mucous membrane and then bluntly dissecting with the finger and thereby tearing through the cellular tissue; (3) by extracting the tonsil from its bed, incising the mucous membrane and then passing the snare or tonsillotome outside the tonsil, thus removing the whole tonsil and capsule; or (4) by forcibly dislocating the tonsil with its capsule from its bed on to the inner surface of the lower jaw-bone and then removing with a special instrument designed for the purpose.

The above-mentioned procedures, or some modification of them, have been for some time the customary methods for the removal of the faucial tonsil.

Of the series of 100 cases (ages of patients 14 to 40) examined from three to ten months after operation, in which some one of the above forms of surgical procedure was employed, deformed throats were found in more than 80 per cent. of the patients and not more than 20 per cent. had throats approaching the normal. In the 20 per cent. with normal-appearing throats the speaking and singing voice, so far as the patients knew, was normal from date of removal of the gland and they had no trouble whatever following the operation. Of the eighty patients, thirty-four complained of speech defects for two or three weeks, sixteen complained of speech and voice defects three months after operation, four practically lost the singing voice, while twenty-six said that they could speak better and their throats felt better after operation than before. About 5 per cent. of the whole number complained of difficulty in using certain words and had nasal intonation six months after operation.

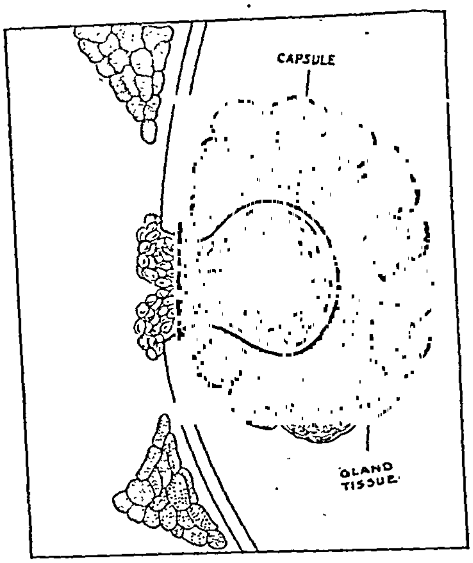

Fig. 8.—Everted tonsil.

The deformities following enucleation seem to follow one of three varieties:

1. The pillars on both sides seem to have disappeared, leaving a flattened surface where the tonsil and pillars formerly were and a much-narrowed opening into the nasopharynx.

2. The pillars on both sides seem to have grown together, leaving but one pillar where there were for-

merly two, with the uvula pulled to one side or the other.

3. The anterior pillar has wholly disappeared and a large amount of cicatricial tissue is deposited on the surface of the posterior pillar, altering its shape and function.

In some of these cases the soft palate and uvula were pulled down to a very much lower level than normal, thus accounting for the nasal intonation complained of by some of the patients. In all the patients in whom the singing voice was affected the posterior pillar was very much out of normal through the contraction of cicatricial tissue. That you may get a better idea of the appearance of these throats I have had composite drawings made from a number of patients (Figs. 1 to 4).

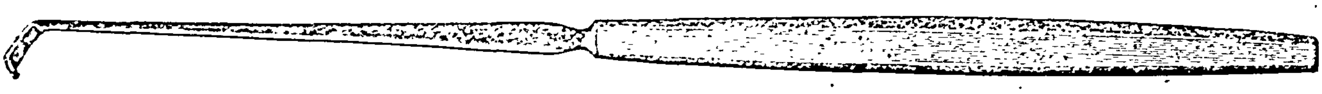

Fig. 9.—Blunt pointed tonsil knife.

From these results I am sure you will agree with me that the last word on tonsil enucleation has not yet been said. I therefore ask you to consider carefully the procedure that has, in my hands, proved to be almost ideal in every way, not only as a means of preventing the unsatisfactory results above outlined but of simplifying the operation for the removal of tonsils.

THE OPERATION FOR EVERSION OF THE TONSIL
(SHEEDY METHOD)

In adult patients the surface of the tonsil and pharynx is swabbed over with a 10 per cent. solution of cocain, the pharynx is cocainized to prevent gagging, and after cocainization has been accomplished a solution of bisulphate of quinin, from 1 to 1.5 per cent., is injected into the cellular tissue surrounding and lying outside the capsule of the tonsil. This infiltration causes loss of sensation and the operation is done without pain. In children under 14 years of age ether should be employed.

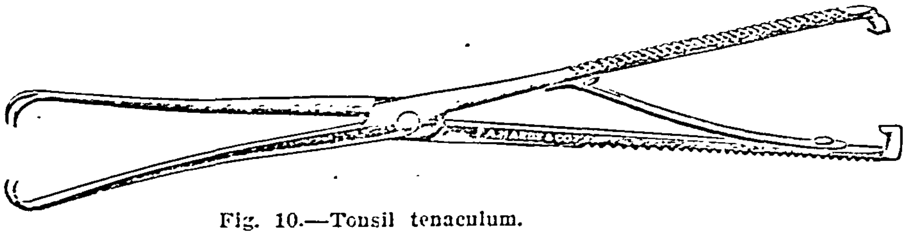

Fig. 10.—Tonsil tenaculum.

Just as the bottom of a bag may be pulled or pushed through its mouth so that its inner surface becomes the outer, so may the capsule of the tonsil. With a tonsil tenaculum inserted as deep as possible into the center of the gland, *avoiding the capsule,* take hold of the tissues extending from one side of the capsule to the other and make traction until the junction of the mucous membrane with the capsule is apparent. Then introduce a small blunt-pointed tonsil-knife (Douglass) under the mucous membrane at the point of junction with the capsule and incise around the tonsil (this incision later on acts as a guide for the wire when the snare is used), and, if the capsule is so contracted that the gland will not invert, make a nick in the upper angle of the capsule comparable to the nick or incision made in the prepuce to permit the escape of the corona glandis in phimosis, and then with a little more traction endeavor to invert the tonsil, as you would invert a uterus by pulling on the cord of a retained placenta. In 90 per cent. of the cases slight traction will invert the tonsil. After it is completely inverted place the snare around the mass as shown on the chart; then slowly tighten the wire, which slips into the slit previously made at the point where the mucous membrane joins the capsule, take from one to three minutes to cut through the tissues, the tonsil will be removed without injury to the pillars, without pain and without hemorrhage.

I have employed this method for the past two years in a very large number of cases and am yet to have my first case in which the pillars have been injured or in which deformity followed the procedure.

There are some exceptions in cases in which the capsule will not evert and from my experience I would place the exceptions in three classes: (1) that of the exceedingly large tonsil, which we frequently see, in which the hypertrophied tissue escaped from the capsule and by traction everted the tonsil, so that we find the tonsil completely everted when the patient applies for treatment; (2) that in which the oropharyngeal surface of the tonsil is so limited by a contraction of the capsule holding within itself a limited mass of cicatricial tissue that it in no way resembles a tonsil; and (3) that in which the tonsil is only slightly hypertrophied, but in which the cicatricial tissue surrounding the capsule has been displaced by fibrous bands due to previous attacks of inflammation and peritonsillar abscesses.

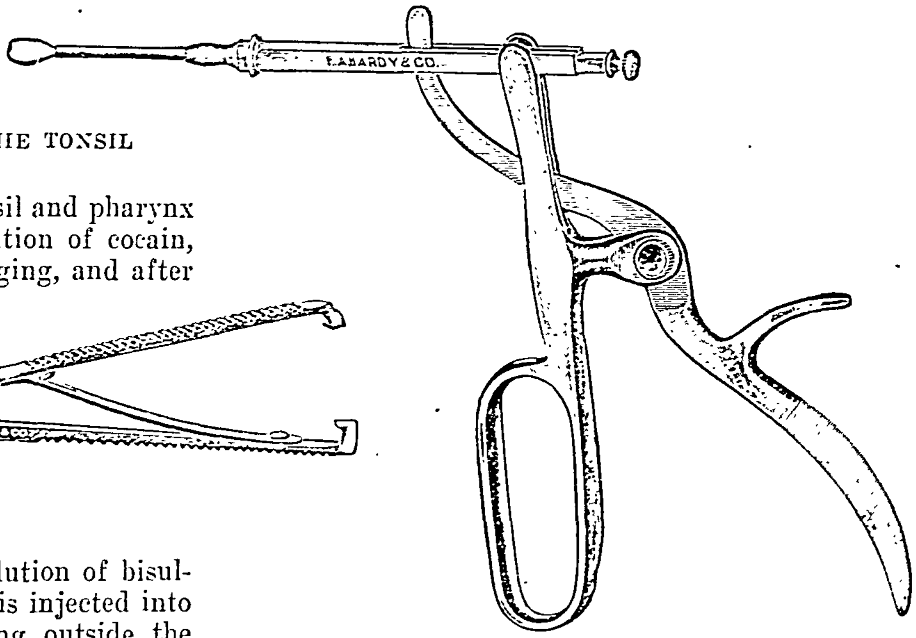

Fig. 11.—Tyding snare.

After two years' experience and after familiarizing myself with the literature on the subject I am convinced that in 90 per cent. of all cases needing operation the proceeding outlined surpasses any measures heretofore known to me for the removal of tonsils.

164 West Seventy-Third Street.

Not Wholly a Medical Problem.—This is but another way of saying that the control and eradication of disease is not wholly a medical problem. It is almost equally a social problem. So long as the general public prefers to submit to the suffering and loss imposed by controllable diseases, medical skill cannot lift the burden.—Corwin and Mayo, in *The Outlook.*

TECHNIC OF TONSILLECTOMY

GEORGE L. RICHARDS, M.D.
FALL RIVER, MASS.

During the last few years an enormous amount of literature has been written concerning the operation of tonsillectomy, most of which has been occupied with trivial details either of position, instrumentation or order of procedure. If general surgery were to occupy itself with so many minor details for each operation the literature of operative technic would be overwhelming. It seems to me time to simplify somewhat our literature of this subject, and describe principles rather than minute details.

The tonsil is a gland set in each side of the back of the mouth; bounded in front by the palatoglossus muscle or anterior pillar, behind by the palatopharyngeus muscle or posterior pillar, and externally and somewhat above by the superior constrictor muscle, and inferiorly lying against the root of the tongue. It is embraced, except on its free surface, with a fibrous capsule, and this fibrous capsule is attached to the boundaries just described. The operation of tonsillectomy consists in the removal of this gland or tonsil with its capsule intact, and with the least amount of trauma and injury to the adjacent structures, especially the soft palate and the palatine pillars. Any technic which removes the gland in the shortest time, and with the least risk to the patient, both present and subsequent, is a good technic, and that technic is best for the individual operator which he has learned to perform well, and which gives him satisfactory results, whether it be the first, second, or any other of the methods about to be described.

It is essential for any method that the parts be sufficiently anesthetized so that the individual is quiet and free from pain, and the position such as to enable the operator to have at all times a good view of the operative field. Both local and general anesthesia, therefore, come into consideration. In individuals with a fair degree of self-control the injection at many points under the edges of the pillars, at their junction superiorly, and in the tissue around the tonsil of a local anesthetic gives very good anesthesia, and for this purpose, in view of the fact that some unpleasant and even fatal results have followed the use of cocain, it is desirable to use a non-toxic anesthetic. So far as my own experience goes novocain is this anesthetic *par excellence,* since it is non-toxic and can be used in 0.5 per cent. solution. Furthermore, it gives a very good degree of anesthesia, and in subjects in which, for any reason, it is desirable not to use a general anesthetic, it serves very well. Other observers have used with equally satisfactory results the salts of quinin bisulphate or sulphate in 2 per cent. solution, also quinin and urea hydrochlorid. It is claimed for these that the anesthesia is more prolonged and lasts for hours. In young children and in nervous individuals, and even in most adults, general anesthesia is to be preferred, since it allows a thorough and painless operation.

PREPARATION

The preparation should be the same as for any major surgical operation; a previous examination of the urine should be made, the blood-pressure taken, the condition of the bowels and the general health noted, and in women the relation to the menstrual period, as it is desirable not to operate during this time.

If there is any reason to suspect hemorrhage the clotting-time of the blood should be determined beforehand. Young children will not usually require much preliminary preparation. I do not think it desirable to operate during the presence of any acute inflammatory disturbance of the tonsil.

POSITION

Position varies according to the individual preference of the operator. In young children and in adults who are not too big and heavy I am in the habit of using the upright position. Young children sit up in a chair, or in the arms of a nurse; adults sometimes in the chair, sometimes on a table, the head-rest of which is raised sufficiently to give practically this position. The advantage of the position is that with a good source of light the operative field is dryer than in any of the prone positions, and it is easier to see a bleeding point, should there be any. Furthermore, having operated in this way for several years, I am more at home with this position.

Dr. T. R. French of Brooklyn recently invented a table for operating in the upright position, and experiments made by him have not shown that there is any more risk in this position than in the prone one. Equally good work can be done with the head over the end of the table, the light being thrown in from above, or with the head on the side and at the edge of the table, the light being thrown in from the side, and the lower tonsil being operated on first so as not to have the blood from the upper one flow over the lower while it is being removed. Opponents of the upright position claim some risk from blood entering the larynx, but I have not found this to be the case. On the contrary, I am inclined to think that the actual bleeding is rather less in this position, as whatever blood comes, being seen immediately, pressure is at once applied to the point whence it comes. Either direct daylight, preferably from the north, or reflected light is provided, as may be desired.

METHODS OF REMOVAL

The methods of removing the tonsil can be divided into five, under some one of which may be included every modification of technic which so far has been described.

1. *Finger Dissection.*—This is the oldest of all methods, having been described before the Christian era, and having been revived several times since by various writers, one of whom I may claim to be. The method consists in insinuating the tip of the finger between the anterior pillar and the edge of the tonsil capsule, detaching the upper one-third of the tonsil, and then inserting the finger between the tonsil and its attachments to the superior constrictor muscle and adjacent fascia. In this way the entire tonsil can be removed. It is advisable that the initial separation be made slowly and carefully, separating the entire attachment of the anterior pillar both upward and downward, and then with the finger between the superior constrictor muscle and the tonsil capsule the tonsil is readily detached above, and posteriorly where it is attached to the posterior pillar. This dissection should be made slowly and carefully, without haste, and when so done can be accomplished with the minimum amount of trauma. The separation of the capsule from the superior constrictor and its fascia presents no difficulties. In a few moments the tonsil is felt to be separated from its attachment anteriorly, above and posteriorly. It remains attached at its base only. It is then grasped with any type of grasping forceps, drawn well out into the center of the mouth, and the snare placed over the part still remaining undetached at the base of the tongue. It is possible to enucleate completely with the finger even at the base, and some operators so do, but it is preferable to complete the final detachment with a

snare. I do not know that the snare has any advantage over a tonsillotome, except that it tends to follow the natural contour of the tonsil better. So far as the question of hemorrhage is concerned, I do not know that there is any material difference. The instruments required for this technic are a mouth gag of good type (I prefer a Whitehead), some form of separating instrument in case the finger is not equal to making the preliminary separation, which is sometimes the case, a pair of grasping forceps, and a snare. A fairly long nail is desirable. This is covered with a rubber glove or finger-cot, which in no way hampers the procedure, so that the finger is as aseptic as any other method. Finger dissection is not suitable for operation under local anesthesia, as the pressure from the finger causes pain beyond the anesthetized area.

2. *Dissecting with Knife or other Dissector; Patient in the Upright Position.*—While this method is susceptible of many slight variations it consists in nothing more than the grasping of the tonsil with some type of tenaculum or forcep, putting it on the stretch, cutting the edge of the capsule where it is attached to the folds of the anterior and posterior pillar, dissecting it from these attachments while still on the stretch with knife scissors or dull dissector, and then detaching it with the snare or some cutting instrument or completing dissection with the knife or scissors.[1] After the tonsil is separated from its pillar attachments, if strong traction is made on it, it tends almost to evert itself. A snare or detaching instrument then placed over it will usually remove it with capsule intact, the snare almost invariably making a clean dissection. This is a nearly ideal method and is applicable in every case no matter what the type of tonsil.

3. *Dissection with Head Over End of Table.*—The operation is done with the head over the end of the table; the light is thrown directly in on the tonsil, which is grasped with some type of forceps and put on the stretch. The separation of the edge of the capsule is made with some form of knife, a simple long-handled, sharp scalpel answering as well as anything else, and the dissection is completed with knife, scissors or some sort of dull dissector, or with strong traction on the tonsil the snare alone readily finishes the dissection. General anesthesia is almost essential for this and the two following methods.

4. *Dissection with Head on Side.*—The head is turned on the side, but the details of the actual removal are essentially the same as in the preceding, the lower tonsil being removed first. The minutiae of detail by these methods is incident to the individual operator, and depends entirely on his personal preference. It is desirable, though by no means necessary, to have two snares, when one may be left in position while the second tonsil is being dissected; the first tonsil is then detached, and then the second.

5. *The Method of Sluder.*—The recently introduced method of Sluder is designed to be done by one or two movements, somewhat after the manner of use of the old tonsillotome—a complete tonsillectomy, without any preliminary dissection. Sluder has lately revived the use of the tonsillotome as an instrument for tonsillectomy. The essential point of the operation is that with the aid of the Physick-Fahnestock-Mackenzie tonsillotome, with a dull blade, or some modification thereof, the tonsil is moved completely out of its normal bed in a forward and upward direction. Then with the aid of the eminence just above the mylohyoid line, produced by the last-formed molar tooth in its socket, the tonsil is pushed through the aperture of the guillotine. This bony projection he calls the alveolar eminence of the mandible. In children the tonsil is posterior to, and for the most part below the eminence, and appears further back and lower in maturity. The alveolar eminence is much more prominent in the young. Its position should be determined just before operating, by introducing the index-finger into the patient's mouth. To utilize the eminence in the removal of the tonsil, the tonsil must be moved forward and upward on to a motionless hard lump, as a solid, fixed and somewhat hemispherical convexity. The *guillotine is placed over the tonsil at its base*, the prominence of the eminence stuffs the tonsil through the aperture, the tip of the index-finger of the other hand being used to assist when necessary, as it sometimes is.

In operating, the tonsil is approached at an angle of approximately 45 degrees, which requires the shaft of the instrument to cross the mouth entirely from the opposite side. This necessitates the distal side of the shaft being applied to the tonsil. It is preferable to operate on the right tonsil with the right hand, and on the left tonsil with the left hand. For further details the operator is advised to consult Sluder's monograph.

This method, in the hands of its originators and those who have carefully studied it, seems to work out very well with a minimum of injury to the parts. I think in the hands of the beginner there is a tendency to do an incomplete operation, and I would not advise a physician who gets good results with his present technic to adopt it, although I recognize that in the hand of its originators it is a well-nigh perfect procedure. I have not yet felt called on to adopt it.

The removal of the tonsil by galvanocautery dissection is to be mentioned only to be condemned. While efficient, it is painful, and has no advantage over other methods.

HEMORRHAGE

For the prevention of hemorrhage, if it occurs, it is necessary to have ready some long hemostats, and to be prepared to tie a vessel if necessary. I do not believe, however, that it is necessary in every instance either to tie every bleeding point, or, as one of my friends invariably does, to suture the anterior and posterior pillars at the time of the operation. I have seen in the last year three cases of troublesome hemorrhage in adults, and none in children and young people among the cases on whom I and my colleague have operated. In two instances attachment of a hemostat a matter of two or three hours served to control the bleeding perfectly, and no other hemorrhage occurred. In the other the vessel was tied. As I said some years ago, in a paper which was commented on unfavorably by Cohen, I still find it very *difficult to tie a bleeding point* in the tonsillar fossa satisfactorily. One's instruments, fingers, mouth-gag, etc., seem to occupy too much room to do the work well, although I know it can be done, and have done it myself, but, as I said, with difficulty. I do not think we throat men become expert enough in tying vessels under difficulties. In several instances in which there was at the moment of operation a little profuse bleeding I have grasped the bleeding point with an artery forcep, given it two or three twists, and the bleeding has at once stopped. After the tonsil is removed with the capsule *in toto* the tendency is for the bleeding vessel to retract into the tissue and not to bleed. Except in adults who have had repeated attacks of tonsillar inflammation and may, therefore, have fairly large vessels supplying the capsule of the tonsil, there is really not much danger to be apprehended from bleeding, but we must always be prepared to cope with it. The giving of chlorid or lactate of calcium for several days previous to the operation has seemed to me to be of some value, and I think that a small dose of morphin given hypodermically before the operation lessens the amount of mucous secretion and probably has some control over the question of bleeding. The multiplicity of instruments used for the tonsil operation proves that the question of technic is really simpler than it seems, since they can all be placed in three classes: first, the instrument to grasp the tonsil; second, the instrument to separate it from its attachments; and third, the instrument to complete the detachment from its external attachments.

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[1] The dissection is preferably begun at the lower half or two-thirds of the tonsil, as here the line of separation between tonsil and capsule is found without difficulty, and forms a good starting-point. The dissection is carried upward and then downward on the posterior marginal border.

The final test of any operation is complete enucleation with the least amount of time, trauma and risk. Let each individual operator endeavor to make himself perfect in the details of the method which appeals to him, and leave the other methods alone.

124 Franklin Street.

ABSTRACT OF DISCUSSION

DR. H. W. LOEB, St. Louis: I so thoroughly agree with Dr. Richards that it is difficult for me to discuss the matter at all. The instrument he shows I would not use, but this is merely a matter of detail, which does not interfere with a full understanding of the principles of tonsillectomy. Not many years ago we decapitated the tonsils; lately we started to do tonsillectomies. Some valuable experience is gained after doing fifty or sixty more or less rudely performed tonsillectomies. Sluder deserves much credit for presenting an operation which can be done quickly. Dissection operations are done so much more rapidly than formerly that many are loath to give them up. The only objection to Sluder's operation is that it is so easy to learn; it is not easy to learn to do the first operation but after it has been done ten or twenty times it becomes an exceedingly easy matter. If Dr. Sheedy can operate on the tonsil in the way he describes and get such results, then the tonsils in New York differ from those in Missouri, and the work can be done more simply in New York than in Missouri.

DR. HOWARD F. PYFER, Norristown, Pa.: The results of tonsillectomy have not been entirely satisfactory. In Dr. Sheedy's series only 20 per cent. of the throats approach normal. His observations are confirmed by Stucky, Kafeman, Lewy, Shurly, Rabe, Stauffer, Getchell, Sawtell and Cocks. Failures in the operation are due, therefore, to using instruments such as guillotines, snares, scissors, angular knives and biting forceps mechanically instead of using our own technical, surgical skill. Instruments may do the work. Even Richards' finger dissection will sometimes succeed, but in small, flattened tonsils or in those bound down with cicatricial tissue following peritonsillar abscesses it is worse than an absolute failure, as it tears the superior constrictor and ribbons the pillars, producing dangerous hemorrhages and traumatism. We want a safe, sure, sane method.

What is good in Sheedy's operation? First, his method of anesthesia, in which he employs 1.5 per cent. bisulphate of quinin. The effect is instantaneous and without any constitutional disturbance or local irritation. Secondly, the use of a blunt-pointed but sharp tonsillar knife. (Fetterholf has shown the value of a superficial incision. Sheedy, however, distinctly states that his incision is intended only as a guide for the snare.) Thirdly, (if successful) the use of the tenaculum inserted as deeply as possible into the center of the gland, avoiding the capsule. Many tonsils, however, are not firm, the tenaculum tears out and then the eversion is a failure; this occurs even for Sheedy. The snare in Sheedy's cases works well, but, again, if there is any error of judgment or the wrong snare is used there is disaster. If one, from old love or traditional reverence must use the snare, Sheedy's method is far the safest and most efficacious. Sluder's guillotine, scissors, biting forceps or scalpel and snares all produce mutilation and are the source of hemorrhage.

Let me suggest a sane, safe, sure method, a mosaic of bright ideas from many sources. It can be used for any tonsil without careful selection, under local or general anesthesia, is successfully performed whether the tonsil is evertible or not, and whether loose, partially everted or bound down by adhesions or cicatricial tissue. No new instruments are necessary. First, use a cocain application followed by a quinin bisulphid injection, as recommended by Dr. Sheedy. Seize the tonsil with any favorite tenaculum or forceps and superficially incise the mucous membrane, thus outlining the tonsil. Dissect close to the capsule, finally arriving at the base; remove the small glands in addition to the tonsil just as tuberculous glands of the neck are followed. Catch any large bleeders with a hemostat, put in a stitch at the upper third of the pillars to increase the rapidity of healing; remove stitch in the morning.

Why prefer this method? Because it is always applicable, needs no perfected instruments, requires no exact technic or selection of certain classes of tonsils and, best of all, because there will be no mutilation or destruction of tissue, no loss of voice, no uncontrolled hemorrhages and, if each operation is conservatively, carefully and consistently performed, makes the surgeon more skilful. When the results to patient and surgeon are so invariably good, is not that a safe, sane, sure operation?

DR. WILLIAM L. BALLENGER, Chicago: The whole field of tonsillectomy has changed in the last fifteen years. I recommended the removal of the tonsil with the capsule intact and this recommendation has since been abused. When Dr. Sluder's operation came out, the other operation was abandoned. I am glad to know how to dissect the tonsil. I abandoned the operation I was doing because I had found a better and an easier way. I have used it for two or three years with the utmost satisfaction in from 70 to 72 per cent. of my cases. The dangers attending Dr. Sluder's operation I fail to meet in many cases. I avoid harming the anterior pillar. It is not so much the question of how you are going to remove the tonsil, but of whether or not you are going to remove it. The individual operator must be considered.

DR. OSCAR WILKINSON, Washington, D. C.: I prefer a triangular forceps. I catch the tonsil near its top, make sufficient traction on the tonsil to see its upper margin, but not sufficient to cause eversion, as that hides its superior outlines, make an incision through the mucous membrane only, and then use a dull dissector, merely scraping the tissue away from the capsule and never making a cut except in the primary incision. I simply peel out the tonsil and capsule. The edge of the knife is never out of view. When I have finished, there is only the smooth tonsillar fossae. The use of the dull dissector is very important and is of great aid. As a rule, I snare the lower part of the tonsil.

DR. JOHN O. MCREYNOLDS, Dallas, Tex.: During the past twenty-one years I have used practically every procedure recommended for the removal of the tonsils. We must all agree with Dr. Richards in his statement that any operation that gives perfect results and that is not objectionable in execution should be continued. At the same time, I feel that we have finally, and only within the last two years, arrived at a practical and perfect method for removing the tonsils; that is, the Sluder method. There are some minor differences in the method of operating. I do not pay attention to the alveolar eminence of the mandible. If I operate on the right side, I use the right hand. I pass the instrument across the oropharynx at an angle of 45 degrees, insinuating its distal end between the posterior pillar and the tonsil, lifting the tonsil upward and forward. The left thumb is passed into the mouth pressing against the anterior pillar, until I feel that there is nothing between the instrument and the thumb except the anterior pillar. With the right hand controlling the instrument, I crowd the blade forward, after getting a sure hold on the tonsil. With the other tonsil I use the left hand, lifting the tonsil from its bed with the instrument, pushing with the thumb of the right hand against the anterior pillar, until the tonsil is pressed through the opening in the instrument, and then complete the section. In this way the tonsil with its capsule is removed absolutely. The operation can be done under local or general anesthesia. Any kind of general anesthesia will give equally good results, but hemorrhage cannot by any means be avoided. If hemorrhage does occur it must be arrested as it would be during any other surgical procedure. This method is applicable in nearly every case of tonsils in children, and in a very large percentage of those in adults.

Dr. Joseph G. Parsons, Sioux Falls, S. D.: Great credit should be given Dr. Sheedy for using quinin anesthesia. I have used it exclusively for local anesthesia in tonsil work for several years. The credit for the discovery of the use of quinin in tonsil work belongs to Dr. Brown of Minneapolis. Quinin is certainly a satisfactory local anesthetic. It has a distinct advantage in that the anesthesia is prolonged and much of the soreness which usually follows these operations is obviated. Again, it is a sort of insurance policy against hemorrhage, as good a one as you can ask for. It is inadvisable to use quinin stronger than in a 2 per cent. solution. This causes an outpouring of fibrin which is a guarantee against hemorrhage. I am glad to hear of its applicability to Dr. Sluder's method. General anesthesia is preferable for the successful application of his method, but it is not justifiable to use it in adults when the operation can be done successfully under local anesthesia.

Dr. Charles Franklin Adams, Trenton, N. J.: It is interesting to note what has been done in the past in the way of controlling hemorrhage. Until the sixteenth century the greatest loss on the field of battle was due to the deaths from hemorrhage. During that century Ambrose Paré instituted the use of the ligature; prior to his time surgeons were in the habit of staunching hemorrhage with the actual cautery, hot pitch and all kinds of styptics of the most cruel and barbarous nature being used. We seldom have deaths from infection, but we still have many deaths from hemorrhage following the removal of tonsils. The only sure way to prevent this is to tie the bleeding vessel, and there is no reason why we should not tie the vein as well as the artery. Tie every bleeding vessel in the throat. Much can be done by compression and torsion in cases of hemorrhage, but this is only temporary.

Dr. C. Armin Gundelach, St. Louis: The statement of Dr. McReynolds that the alveolar eminence of the mandible is unimportant and may be ignored in the fulfilment of the Sluder operation prompts me to report my observations, which are quite in contrast to his. I feel that it is very important to take cognizance not only of the contour but also of the position, size, and shape of the alveolar eminence and of the slanting surface just posterior to the eminence. It has been my privilege and pleasure to see many operators when the tonsillectomies were performed with the Sluder method for the first time, and I have constantly found that failure to utilize the alveolar eminence invariably left a part of the tonsil behind. These facts were again demonstrated to me only this morning when I operated at the Eliot Memorial Hospital and then watched an operator try the method for the first time. In failing to utilize the alveolar eminence the instrument is usually kept too far back in the throat and the finger cannot be passed over the entire aperture of the guillotine, so that not only does the alveolar eminence fail to force the tonsil through the opening, but the finger is also prevented from completing the invagination of the tonsil. Furthermore, it is important to take cognizance of the eminence, for the instrument should not only be brought up to it but, once having come in contact with it, should also be held firmly in that position till the blade has descended and engaged the tonsil perfectly. The original instrument has been modified by Ballenger, Beck and others. I would suggest to the surgeon who is performing the Sluder operation for the first time that he use the original guillotine because its range of application is much wider and more simple than the variously modified forms; especially is this true, I think, of Dr. Ballenger's modification in the use of which the hand must be flexed to the utmost on the forearm, so losing the strength and security of a stiff wrist-joint in its normal position.

Dr. C. F. Welty, San Francisco: Applying a ligature to a bleeding vessel after tonsillectomy is very unsatisfactory, because of the danger of its slipping. I prefer to use a small aneurysm needle similar to the one Yankauer brought out for carrying my ligature. It is a means by which we can tie tightly and securely. After tonsillectomies it is also satisfactory to paint the cavity with tincture of iodin.

Dr. G. Sluder, St. Louis: I appreciate the honor you have done me and I am glad that my technic has been in the hands of friends. I believe, however, that it is well to adhere to whatever technic is employed, if you get good results. No one technic is satisfactory to all cases or to all men. It seems to me that my operation has the advantage of lightning-like execution. When occasion arises, I can remove tonsils, both faucial and throat, in twenty seconds under gas anesthesia, although I do not think it is always advisable to operate with such speed. The question of instruments I have omitted.

There is one constant factor with which we have to deal. When one man states that he cures over 50 per cent. of his cases, and another says that he cures over 70 per cent., and if you appeal to him and say that you can cure from 80 to 90 per cent. (and in my hands 99.6 per cent.) of all the tonsils, what will he say? In St. Louis one good man had twenty-four peritonsillar infiltrations in succession, and yet he placed his results at 99.8 per cent., which shows perfect execution.

One thing that always makes trouble is the establishment of an infiltrate about the tonsil. With some the sense of touch is so exact that a tonsil but one-quarter of an inch thick can be detected and removed and the cavities rarely exceed one eighth or usually one sixteenth of an inch. They are always troublesome and button-holing often results. There is one particular point that makes trouble, a small lobe high up at the junction. In attempting its removal vomiting or gagging efforts may result. Do not attack the alveolar eminence of the mandibulum, but take the upper one.

Dr. A. M. Corwin, Chicago: In my paper on the Sluder method read yesterday instead of to-day, by courtesy of the society, I took up the quasi objections to Dr. Sluder's operation and answered them. From the absence of all unfavorable criticism, I see that the method is evidently recognized by this body at its true value. I believe that it is here to stay. We perfect ourselves in one method and get satisfaction. A new principle or technic is suggested. We try it out and, if it is better, we adopt it. In this direction lies progress. A better method may yet be evolved, but ten years from now I believe that the Sluder principle will be most universally used.

Dr. Richards has practically covered the field of various methods in a broad way. But I think all methods can be classified more generically into four groups: (1) finger dissection—unsurgical and practically discarded; (2) cauterization of limited application; (3) pulling the tonsil from its bed with forceps, loosening by dull or sharp dissection and final severing with snare or cutting edge; (4) "Sluderization," which pushes the gland through a fenestra using the finger within the mouth and the apposed alveolar process.

In performing the Sluder operation we do not aim so much to get behind the tonsil with the fenestra as below and behind its lower pole. Pressure with the instrument upward, forward and outward keeps the gland in front of the fenestra, and counterpressure from the jaw and more especially from the operator's finger puts it through. This is the epoch making trick involved in the Sluder method.

Dr. George L. Richards, Fall River, Mass.: Throat specialists should know how to tie arteries better than they do; there are very few of us who have acquired the technic required for this procedure. I believe that the point in learning the technic of tonsillectomy is this: If the technic one is using is satisfactory, let him continue it, perfecting it in any details with which he is not satisfied. If he is not satisfied with present technic, let him pick out one that he wishes to learn, go to the man who has perfected that technic and learn from him how to do it.

THE RELATION OF OPHTHALMOLOGY TO DISEASES OF THE NOSE AND ITS ACCESSORY SINUSES

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The possibility of involvement of the orbit or its contents in diseases of the nose and accessory sinuses has been so well established from an anatomic point of view as to need no further proof. It is only necessary to study the investigations of Onodi, Birch-Hirschfeld and Loeb to be convinced of this fact. When considered from a clinical point of view, however, the frequency of the association is less constant than the anatomic investigations might lead one to suppose. While in many cases the causal connection is obvious, there are others in which a relation is difficult or indeed impossible to establish.

Diseases are excited in the eye through the nose by direct communication, in the orbit through the anatomic relations of the accessory sinuses, through nervous reflex action, and as a result of general toxemia. It is not always easy from subjective symptoms alone to determine whether the origin of the symptoms-complex is in the eye, the nose or the sinuses. The fact that an eye lesion coexists with a sinus infection is not in itself evidence enough to establish a causal relation. I have seen for instance, a case of tobacco-alcohol amblyopia, giving all the classical symptoms of retrobulbar neuritis, in a patient who had a chronic sinus involvement. Operation was advised, but postponed for various reasons. Alcohol and tobacco were discontinued and the patient made a good recovery. The operation on the sinus was not performed.

The enthusiasm manifested in the reports of cases following the publication of the work of Onodi lead, I believe, to conclusions that are not altogether warranted by the history of the cases reported.

A study of the reports of well-authenticated cases, however, leads to the conclusion that many of the diseases of the orbit or its contents can have their origin directly or indirectly in diseases of the nose, the accessory sinuses or the ethmoidal cells.

These diseases have been classified by McKay as follows:

1. Mucoceles of the sinuses.
2. Acute and chronic sinusitis with external signs of orbital cellulitis, orbital abscess, tumor growth, edema of the lid or dacryocystitis.
3. Sinusitis without external signs of orbital inflammation, but with ophthalmoscopic signs, as optic neuritis, neuroretinitis, retinal thrombosis or phlebitis; or without opthalmoscopic signs but with visual disturbance as scotoma, visual-field defects, ocular muscle paralysis or fifth nerve disturbance.
4. Cases in which the association of sinus disease has been asserted but questionable glaucoma, iritis, uveitis, keratitis, cataracts and vitreous opacities.

This classification should be modified possibly in some of its details, but the scheme in general is excellent. I shall not speak of the first two groups, but rather confine my remarks to the third and fourth.

The involvement of the optic nerve is said to be due to mechanical pressure by inflammatory exudation in the neighborhood of the sinuses, to distention of the sinus wall, to toxemia, or to occlusion of the central vessels, by embolism or thrombosis. The ophthalmoscopic examination may reveal hyperemia, a congestion with or without edema, a neuritis or a general atrophic process including the whole or part of the nerve. The patient may complain of dimness of vision in one or both eyes, vertigo, headache and other head symptoms. One or both eyes may be affected.

One of the most serious nerve affections depending on sinusitis is the retrobulbar neuritis, in which the papillomacular bundle becomes affected. The reasons often given for this early involvement (as shown by a central scotoma at first relative and later absolute) are pressure on the exposed portion of the particular bundle, pressure due to vascular changes in the central retinal artery, or toxemia. When one considers the position of the papillomacular bundle in the nerve and its relation to the central artery, it is difficult to see how pressure symptoms can play so important a part as is often assumed.

The macular bundle occupies the peripheral portion of the optic nerve for a distance of about 13 mm. from the globe. It then enters the nerve and soon becomes axial, where it remains throughout the remainder of its course.

The central artery enters the nerve at about the point at which the macular fibers begin to enter. At no time are the macular bundle and central artery in intimate relation.

Because of the proximity of the sinuses to the orbit, a general toxemia may be overlooked in our desire to establish a direct communication as the course of infection. The character of the infection or lack of resistance of the individual to the particular strain may be the cause of the optic nerve involvement, rather than anatomic proximity of the source and dominant symptoms of the infective process. This belief is substantiated by the statement of Onodi that there seems to be no relation between the sinus involved and the nerve affected. Is it not possible that chronicity rather than the location of the infection has most to do with the possibility of optic-nerve involvement, and that a toxemia rather than pressure is responsible for the eye symptoms? This might explain the oft-quoted saying: "The worst sinus cases seem to show the least eye involvement."

Whatever the source of the eye symptoms may be, some brilliant results have been obtained in retrobulbar neuritis through treatment of the sinuses, and no examination of these cases is complete which does not include that of the rhinologists.

The possibility of optic atrophy from posterior ethmoidal suppuration, or from pressure dependent on some sinus involvement, cannot be denied; but to establish a causal relation between the two is most difficult. I have never seen a case of optic atrophy, the origin of which I could prove was due to disease of the sinuses or ethmoidal cells.

That there should be wide variations in the experience of different observers is not to be wondered at when one considers the relation of the optic nerve as given by Onodi. He says:

> The optic nerve may come in relation with the sphenoidal sinus or ethmoidal cells, and the wall of the sphenoid may be very thick. The variation in thickness ranges between 1 and 12 mm. It is evident that even destruction of bone may occur in accessory sinuses and yet no visual disturbance result.

While there is no form of visual field contraction which can be considered pathognomonic, there is scarcely any variation in the field that may not be produced by disease of the eye secondary to accessory sinus infection. The most common deviation from the normal occurs in cases of retrobulbar neuritis in irregular central scotomas with or without ophthalmoscopic findings. The attempt to establish a diagnosis of the sinus involved by the quadrant of the field affected has not been successfully established. That there is no uniformity of opinion in this whole subject is shown by the opposing statements of such men as Birch-Hirschfeld and Onodi. Birch-Hirschfeld asserts that central scotoma is an early and important symptom of tumor or suppuration in the posterior sinuses, due to damage to the papillomacular bundle, while Onodi has observed the absence of these phenomena in similar cases and also in one case of sarcoma filling up the nasal cavity. He also asserts that the visual fields are not narrowed in cases of ethmoidal cell suppuration. The more one studies clinical perimetry, the more one hesitates to base any diagnosis on the field findings alone.

The enlargement of the physiologic blind spot has received much attention recently as of diagnostic value in retrobulbar neuritis, but as yet our knowledge of the normal limits of the blind spot is too vague to warrant definite conclusions.

While paralysis of the extrinsic ocular muscles is of exceedingly rare occurrence in sinus involvement, paretic conditions may complicate mild cases of sinusitis, and become manifest as an insufficiency of one or more of the ocular muscles. The muscle itself or the nerve supplying it may become involved. The function of the muscle may be but slightly interfered with, and diplopia may not be present. The binocular vision may be reduced considerably, while the vision in either eye taken separately may be normal. The diminished binocular vision arises from the inability on the part of the patient to fuse the two images because of the muscle imbalance rather than from any deterioration in his visual acuity. As the impairment of muscular action becomes more marked, a diplopia will appear which, however, may have been present from the first in the extreme field of action of the muscle affected. Muscular insufficiencies are usually seen in cases showing acute inflammatory processes. Marked displacement of the globe may be found in cases in which the false position is assumed so gradually that the desire for monocular vision keeps the visual axes in their proper relation and the muscles adjust themselves to the changing position. Owing to their anatomic relationship the levator, the superior rectus, the superior oblique, the internal rectus, the inferior rectus and the inferior oblique are most exposed and therefore most often affected in sinusitis. The particular muscle involved may suggest the sinus affected, but as the lesion is often multiple too much reliance cannot be placed on this finding.

In certain cases the ocular symptoms may be the only demonstrable manifestation of the sinusitis, the results of nasal examination being negative as well as those obtained by transillumination and roentgenography. If all other etiologic possibilities can be reasonably eliminated, it is becoming common practice to operate on the sinuses in cases showing ocular symptoms which have been proved to exist, such as an infection of the orbit, or retrobulbar neuritis. On the other hand, in cases which show optic atrophy or true paralysis of the extrinsic muscles, confirmatory local symptoms should be present before surgery is resorted to.

I have had occasion to study only two cases of thrombosis of the central vein with reference to sinusitis, and in neither case was I able to establish a causal relation. The sinuses were not explored by operation, however, and as no satisfactory etiologic factor was determined in either case, the real source of trouble may have been overlooked.

In regard to the fourth group in our classification, cases in which the association of sinus disease has been asserted but is questionable, I should make some change. Included in this group are glaucoma, iritis, uveitis, keratitis, cataracts and vitreous opacities. I can see no reason why iritis and also uveitis should not result from an infection of the sinuses, just as they result from a similar infection in the alveolar process or the prostate.

The number of diseases remaining in the last group may be even less when their etiology is better known.

ABSTRACT OF DISCUSSION

Dr. R. Bishop Canfield, Ann Arbor, Mich.: I agree with Dr. Parker in many of the points he has made. As he said, it is important to understand that "the fact that an eye lesion coexists with the sinus infection is not in itself sufficient evidence for the establishment of a causal relationship." Enthusiastic believers in the intimate clinical relationship of the eye and accessory sinuses have found that many patients have been relieved from distressing headache and other symptoms of eye-strain after the refractive error has been corrected and the sinus operation performed. They have not always been able to tell to what procedure to attribute the result. I have often heard it stated that those who do not believe in the intimate clinical relationship between all the diseases of the eye and pathologic conditions in the accessory sinuses either were not able to make an exhaustive examination of the sinuses or did not care to do so. On the other hand, conservative men are now of the opinion that the most ardent supporters of the theory are being led away by their enthusiasm. The danger of operating on healthy accessory sinuses must not be overlooked. In my opinion, an operation on a healthy sinus is productive of more bad results than operation on the diseased sinus. I have under observation at present patients whose healthy sinuses have been operated on and whose condition is unsatisfactory; indeed, a great deal worse than before the sinuses were interfered with.

Indiscriminate exploration of the accessory sinuses without special indication and in the absence of corroborative Roentgen-ray and transillumination findings is to be deplored. Although there is no argument but that orbital suppuration and infection of the uveal tract are generally due to extension of disease from the accessory sinuses, trustworthy evidence to the effect that optic atrophy or glaucoma is dependent on sinus disease is, so far as I know, lacking. I do not believe that the sinus involvement can be determined by the character of the muscle insufficiency in view of the fact that some tremendous change in both sinuses and orbit does occur without the occurrence of any muscle anomaly. While I firmly believe in the occurrence of fundus lesions as the result of sinus disease, even as the result of so-called cryptic sinus disease, I am strongly of the opinion that operative exploration of the sinuses should be undertaken only after the most exhaustive and repeated clinical and laboratory examinations have been made. In this connection we must bear in mind that the orbit and its contents may become involved not only as the result of direct extension, but also as the result of toxemia or sepsis caused by the accessory sinus disease. The importance of this last group of cases must not be overlooked. In case exploration is decided on, it should be made in the most conservative manner possible until the extent of the sinus involvement has been learned, and it should be borne in mind always that operative interference with a healthy ethmoid, antrum, frontal or sphenoid may be followed by very unsatisfactory subjective results.

I have come to the conclusion that the average laryngologist knows less about the anatomy of the ethmoid than he does about the anatomy of any of the other accessory sinuses, yet he attacks this region with impunity and ventures blindly into what is to him practically an unknown country, yet it is this region which is most intimately associated anatomically with the orbit and its contents.

Finally, while accessory sinus disease is certainly an important factor in the causation of fundus lesions, it is by no means so universal as one would be led to suppose by perusal of the literature.

Dr. John B. Potts, Omaha, Neb.: I should like to report one case. Dr. Parker mentioned that an eye lesion was rare when there was sinus trouble. I have had one case that exemplifies that point nicely. A woman had a cold and a severe, persistent headache. It was thought that there was some involvement of the frontal sinus, the antrum or the ethmoid. Drainage seemed to be fairly good. The discharge was clear. Refraction seemed to cure the headaches except over one eye. The glasses were changed once, and atropin was used frequently, but with no effect on the persistent pain in the left eye. The middle turbinate of the left side seemed to be involved and enlarged. It seemed to me that the drainage from the ethmoid was good. I removed the turbinate and found a cellular condition. The pain in the left eye then ceased and has not returned since. What was the relation between the eye and the condition found?

Dr. George E. Shambaugh, Chicago: I should like to report in this connection three unusual cases of accessory sinus trouble that have come under my observation during the past year. The first was a case in which the diagnosis of a phlegmon of the orbit had been made, but in which an exploratory incision had failed to discover any pus. An examination of the nose showed a narrowing nasal passage on the affected side with a very slight alteration in the floor of the ethmoid. Tissue removed from this region demonstrated the presence of an epithelioma. The second case was that of a young man who had suffered for several years from severe headache and for a couple of years from severe hemorrhage from the nose. An examination of the eyes by Dr. Wilder disclosed nothing abnormal. The patient died from a severe hemorrhage from the nose. At necropsy a sarcoma was found involving the sphenoid sinus and the postethmoid cells. The third case was that of a woman in middle life who had suddenly lost the sight in one eye completely and in the other eye partially. Her trouble had lasted but a few weeks when I saw her. She could scarcely recognize fingers before the better-seeing eye. The eye symptoms had been preceded a couple of weeks by a severe cold in the head and headache. On examining the nose I could not make sure of any accessory sinus trouble. The history of the case led me to suspect an accessory sinus condition as the cause of the blindness. I opened the sphenoid sinuses and postethmoid cells. The operation had to be done under ether. I could not recognize any positive evidence of disease at the time of the operation. The patient recovered the sight completely in one eye and partially in the other.

Dr. Corydon G. Dwight, Madison, Wis.: The one point I wish to raise is the possibility of an association between sinus disease and brain-work. I have in mind a senior at the university who during his sophomore and junior years had trouble with his eyes and came to me for refraction. The glasses ordered gave him no relief whatever. I did not make a nasal examination then, but later I did and found a large middle turbinate and necrotic bone and involvement of the entire ethmoid. Many of these brain-users with accessory trouble complain more of their eyes.

At the same time I had a domestic, but one who did not do any brain-work. She had perisinusitis and absolutely no ocular symptoms.

In the clinical department at the University of Wisconsin Dr. Evans carried on a painstaking research and he reported that nearly 80 per cent. of the persons seeking treatment were either nasal or eye sufferers.

There is an acute ethmoidal trouble, which I believe was named by Dr. Sluder vacuum sinusitis, in which this condition exists. There is some hyperemia which produces symptoms and in many of these cases operation is not necessary. I believe that in 75 per cent. of the cases cited to-day the patient can be relieved by thorough washing out of the nose and keeping it clean. I do not think that patients must always be operated on. I believe in watching them, however, with great care. I have seen a great number of these cases and I am convinced that in many of them operation is not necessary. In some instances, however, it may be necessary to remove the turbinate. If there is a large middle turbinate, the region cannot be ventilated without operation.

Dr. H. W. Loeb, St. Louis: A great deal of enthusiasm centers about the relation of the eye, ear and nose. My understanding of the subject was fairly well brought out in the anatomic specimens which were shown at the New York Academy of Medicine some years ago. In the great majority of cases the sphenoid is in relation with the optic nerve at its roof, and the opening of the sphenoid is in the middle third of the anterior wall, which allows a fair column of air between the level of whatever pus is present and the optic nerve. In five of the specimens presented, however, the optic nerve was either above or on the level of the orifice of the sphenoid. This naturally suggests the increased likelihood of infection in such cases, when pus is present.

With respect to the ethmoid, ordinarily the optic nerve passes close to the posterosuperior external angle of the last posterior ethmoid cell. This explains why, although suppurative inflammation of the ethmoid is common, it is seldom accompanied by disturbances of the optic nerve. In two instances, however, in which the ethmoid cells either displaced or surmounted the sphenoid the relation was different and the optic nerve ran along the external wall of the posterior ethmoid cell. Any disease of that particular cell would be far more likely to affect the optic nerve than the usual conditions.

The following case is of interest. A boy, aged 15, overgrown, hale and hearty, was taken with some affection of the eye. He noticed that his eyes lacrimated a great deal, that he had headaches and could not see well. After five weeks he was practically blind. The ophthalmologist referred him to a neurologist and the neurologist in turn referred him to me. There was swelling of the disk amounting to about 4 diopters on one side and 6 diopters on the other. There was a slight amount of vision on the left side. I found an acute ethmoiditis on both sides. The patient was sent to the hospital for operation. Forthwith the swelling decreased in one week, the vision increased, the headaches disappeared and the patient left the hospital entirely free from symptoms. He has been examined since and continues to have clear vision.

I think that in this type of case the posterior ethmoid cell extends posteriorly over the sphenoid to a greater extent. This patient had an acute ethmoiditis and the optic nerve was involved.

Dr. F. P. Emerson, Boston: I wish to relate two cases in which there were eye symptoms with apparently no evidences of any catarrhal process in the nasal mucosa, and yet that was the region in which the trouble was located. A woman, aged 38, had suffered from constant left supra-orbital headaches for twenty years and they occurred about twice a week. She was examined by the best men in the country. One treated her for faulty metabolism for one year. An eye man treated her eyes for a year. She was unable to find anyone who could alleviate her sufferings. Her headaches were very severe. She had clean nasal mucous membranes and no catarrh, but she did have nasal symptoms. Anything which produced nasal turgescence, such as sweeping, automobile riding or the menstrual period, would start this pain. These were distinct nasal symptoms. In looking into the nose you could see that she had what has been described so accurately by Dr. Sluder in writing of the conditions necessary to produce negative-pressure headaches, a septum deviated to the left side high up; the middle turbinate was close to the outer nasal wall and there was an enlargement or hyperplasia of the anterior end. Ewing's sign was present; that is, she was sensitive under the supra-orbital arch. I removed a portion of the turbinate and opened one or two cells in the uncinate process to free the nasofrontal duct and she has had only two attacks of headache in two years.

The other case was that of a young woman who was supposed to have had a nervous breakdown and who had constantly recurring headaches, with pain through the right eyeball. She was constitutionally nervous, but it was thought that there was some other underlying cause for the headaches. The examination of the nose showed the same anatomic conditions presented in the other case. The middle turbinate was slightly enlarged and the region under the supra-orbital arch was very sensitive. The patient was cured by establishing drainage in the region of the nasofrontal duct.

I have seen several cases of the type Dr. Shambaugh describes in which there seemed to be a cellulitis, but in which nothing was found when an incision was made in the orbit. Here the trouble seemed to be in the posterior ethmoid region. In these cases, especially those described by Dr. Sluder, there are conditions which we overlook. If we have definite nasal symptoms and can find the anatomic conditions exactly as outlined, we shall be able to relieve these apparently intractable cases of headache or eye-pain.

Dr. C. F. Welty, San Francisco: I agree heartily with the criticism by Dr. Canfield. I have seen extensive disease of the sinus with few or no eye lesions. I wish to speak of the importance of the cerebellar pontine-angle tumors. This new work of Barronies makes possible an almost absolutely certain positive diagnosis. I have had four or five of these cases, a report of which will appear in the literature shortly.

I wish to speak also of an unusual condition, the association of cerebral tumors with mastoid conditions. I have had a case of this kind. It was one of acute mastoiditis with characteristic symptoms including facial paralysis and paralysis of the external rectus, which I did not recognize at the time. It was an ordinary case and operation was done. The paralysis was supposed to have been cured in a few days, but the patient did not recover. The man gave the history of having some growth in the mouth, which he had noticed three months previously and which was evidently postpharyngeal and hard. It filled the postnasal fossa. Four or five days after the mastoid operation the facial paralysis continued and the man complained of more headaches. I diagnosed brain abscess. The man would not submit to an operation and he died in a short time. Post mortem a sarcoma was found which extended from the postpharyngeal space of the pharynx, filling the entire middle fossa. I thought we were justified in assuming that this man had a brain abscess. I have never known nor read of such a tumor as that.

Dr. George L. Richards, Fall River, Mass.: We should be quite certain of the indications for operation before doing anything very extensive in the nose. There is such a thing as a proper conservatism. Not every patient is bettered by a nose operation, and we dwellers in the smaller cities where the end-results over a long period of time are known to us have to choose our operative cases with more care than the surgeon in the metropolitan center who never sees the patient after the operation and loses sight of him immediately after treatment is finished.

Dr. J. C. Beck, Chicago: It is a wonder to me that no text-book speaks of any relationship between our specialty and neurology. I should like to report two cases. The first is a particularly interesting one. A young woman, a nurse, was referred to me by an ophthalmologist in Chicago. He said "I am sending to you a young woman who has a mental condition that is said to be catalepsy; please examine her and see what you find." I went over the case carefully. She had had a frontal sinus operation and a mastoid operation, and the hole in her nose was big enough to place a finger in, yet there were no evidences of suppuration, except that the parts were somewhat crusty. She appeared sallow, but not sickly. She was taken to the hospital and five different men made examinations of the blood, etc. I was asked to watch the patient. She would go to sleep at 5 a. m. and continue in a cataleptic state from which she could not be awakened; even sticking a pin in her would not awaken her. She had a slight twitching of the eyes. A diagnosis of hysteria was made. An external operation on the mastoid was done and she has since been absolutely normal, except for pain, which is now the only symptom of which she complains.

The other case is an important one from a neurologic point of view. This was a case of tumor in the region of the pontine cerebellar angle. It was a glioma which was observed by the best surgeons in New York, Philadelphia and Chicago. The patient was a man, 40 years old, who died from respiratory paralysis. A tumor was found post mortem at the base of the occipital lobe far inward. This patient had severe pain or headache which was referred to the front part of the head. One diagnosis made was syphilis of the brain; another doctor said it was possibly a tumor in the anterior portion of the brain. This shows how difficult it sometimes is to make a diagnosis. I believe that we should have a society in which neurologists, otologists and laryngologists can get together and discuss these matters so that we shall be able to understand these subjects better and to make better diagnoses.

Dr. William L. Ballenger, Chicago: I have not heard it stated that we should verify our diagnoses by roentgenoscopy. In private work it is exceedingly rare to have a patient operated on without having from two to four pictures made to help verify the diagnosis and get an exact location of the sinus disease. By using the skiagram we are enabled to open the sinus at the exact point indicated in the plates.

Dr. Howard F. Pyfer, Norristown, Pa.: In small cities we are called on to do eye work as well as nose and throat work. My experience has been that the condition in the sinus which gives the patient trouble is due not to a large amount of pus present, but to a hyperplastic degeneration of the mucous membrane of the sinus. A radical operation is seldom necessary. Fracture of the middle turbinate toward the septum will often bring results. Many patients come to me for an ophthalmoscopic examination with the retinal veins congested and the disk hazy and injected. A rhinologic examination frequently shows that the diseased condition is in the nose.

Dr. Adams of Trenton states that many children complain of their eyes when the symptoms are produced by adenoids. Usually they have been sent by doctors, parents or teachers for glasses. A weak spherical or cylindrical glass gives partial relief, but Dr. Adams has shown that it is not the refraction that is at fault but the adenoids.

The State Hospital for the Insane is located at Norristown, An examination of the ears of the patients is frequently made and the resident physician sends immediately for the otologist if any ear complications are noticed. Despite these precautions and examinations, at necropsy a brain abscess otitic in origin is frequently discovered.

Dr. Dercum has said that a brain abscess can be present with no symptoms. Can he show us how a brain abscess may always be diagnosed?

Dr. John B. Potts, Omaha, Neb.: I should like to second what Dr. Ballenger said regarding the use of the Roentgen ray as an aid in diagnosing these conditions. The condition of the eye is a troublesome one and closely related to the conditions found in the nose with a peculiar formation of corneal ulceration. Here we find intense pain and photophobia. These ulcerations will heal up in two or three days or a week, but they will recur. They are most likely to occur on the periphery of the cornea and not at the center. They recur a week or months apart and will recur in spite of all that may be done for them. An examination of the nose might disclose a deflection of the septum to one side and a pinching of the middle turbinate; an enlarged vomer, or ethmoid trouble, etc., may be found. In most of the cases there is not any distinct ethmoiditis. The correction of the deflected septum, however, will cause the ulcerations to clear up at once. This condition is usually associated with blepharitis. There is ciliary congestion. This is very painful to the patient; he cannot use his eyes at all and the condition will continue to recur unless this operative procedure is resorted to. I should like to cite a case referring to what Dr. Welty said about not seeing indications from the nose: A patient was taken with acute ethmoiditis following a cold which he contracted in St. Louis. He came to Omaha. I found complete blindness in the right eye and that he could count the fingers with the left eye at not farther than 2 feet. The skiagram showed both sphenoids filled with pus. On opening both sides the condition at once cleared up.

Dr. W. R. Parker, Detroit: Dr. Shambaugh's cases illustrate well the point I wished to make. Two patients were without eye symptoms and one undoubtedly showed eye symptoms of sinus origin. I think these conditions are possible, but rare. I did not include in the paper inflammatory conditions of the conjunctiva or cellular tissue of the orbit, nor did I include reflex headaches, or cases of corneal ulcerations which depend on affections of the lacrimal apparatus. Cases of this kind are more common and well understood. My experience agrees with that of Dr. Dwight. In large student bodies we do meet cases of reflex headaches due to eye or nose affections. In these cases congestion of the mucous membrane of the nose, of the sinus and of the ethmoid cells may be found. A low-grade retinitis or a "fluffy chorioid" may also be found. You may refract and re-refract in these cases, but you will not cure them. If you relieve the nose and sinus condition, the patient will at once feel better. The trouble is not, it seems to me, due to the use of the brain, but rather to a relaxed condition of the mucous membrane incident to sedentary life. Get these persons out in the fresh air, with exercise and good food, and their symptoms will disappear.

THE MEASUREMENT OF AUDITORY ACUITY*

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The measurement of auditory acuteness is generally construed to be synonymous with the quantitative estimation of hearing and at first thought it would seem to be all that is implied by the term, and all that need be attempted in this method of examination. But a more comprehensive interpretation would compel us to include a qualitative as a really necessary part of a quantitative exploration of the auditory function, for in order that measurement of auditory acuity be complete, it should not be confined to the estimation of the power for the perception of one or even several tones, but the entire scale. According to the Helmholtz theory, each tone is separately perceived by its own particular cell and fibers which respond to this and no other. Therefore, the quantitative measurement in the usual restricted sense would test but a limited part of Corti's organ, leaving the rest unexplored.

Conversely, it is equally illogical to consider that the qualitative method can be completely divorced from the quantitative method of examination. Indeed, I maintain that actually it is impossible to do so, because we know, in both health and disease, the capacity to perceive tones of different pitch in different degrees of power, so that it can never be a question of perception only, but must also be a question of the amount of energy necessary to produce an excitation at the threshold of each and every tone.

At the two extremities of the scale points will be reached, of course, at which tone perception fails, no matter how powerful the stimulus, because the organ of Corti contains no elements which are capable of responding at all to sound-waves slower than twelve or sixteen or twenty, or more rapid than thirty or forty or fifty thousand vibrations per second, as the case may be, and, therefore, amplitude of the waves beyond such limits are of no concern.

Occasionally too, in the midst of the scale a hiatus will exist where perception for certain tones is completely lacking. But we believe that in reality the hiatuses are seldom absolute, but consist rather in a lessening of the auditory power for the tones in question, which might be still excited to auditory perception by sound-waves of adequate amplitude.

Let us consider specifically the most commonly used methods of examination of auditory capacity with a view to determining their value and their relative advantages and disadvantages.

SPEECH

The voice in speech is regarded by many authors as the ideal instrument for the measurement of hearing on the ground that we thereby test the auditory organ in what is really its chief function.

The singing voice of an average individual has a compass of about two octaves; the average speaking voice that of a few semi-tones. The normal audition, as we know, extends over a range of about eleven octaves. Speech, therefore, can test it in but a small proportion of its full extent. This being in the most used and perfected part of the cochlear organ, will therefore represent its most sensitive area.

If our purposes are merely practical, such consideration would recommend the speech test as a desirable method. But otologic science cannot be satisfied except by a more analytic method of mensuration. Moreover, the speech method of testing is of all the least accurate. As we have no means of graduating the intensity of the voice, we endeavor to start with a given vocal power and measure auditory acuity by varying the distance between patient and examiner.

But unfortunately such a method of testing audition is open to several sources of error. In the first place a uniform standard of intensity is not possible of realization. Voices differ not only in pitch, but also very materially in their clang-tint or quality, due to the presence of harmonics. Voices whose fundamental tones might be of the same intensity would, therefore, be heard differently according to their particular harmonic character.

It is not possible except in an approximate way to determine the dynamics of the voice. Our qualifying adjectives, "low," "soft," "loud," "ordinary conversational," as applied to speech, it must be admitted, constitute inexact expressions, which cannot serve as definite guides for intensity.

An ordinary conversational voice of one person may have a carrying power very different from the conversational voice of another, and even the same individual cannot be certain that it will be the same at different tests. It will not only fail, therefore, to serve as a standard comparable among different examiners, but even for the same examiner when testing the same case at different times.

In employing the voice as a means of testing hearing we may make use of phrases of sentences, of different words, of numbers, or of nonsense syllables.

The use of phrases or sentences is open to the obvious disadvantage that the individual examined will supplement his defect in hearing by his apperceptive faculties and guess what has been said by the context, aided by the emphasis and inflection of the speaker. Results, therefore, will depend greatly on the intelligence and education of the person being examined.

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* Because of lack of space, this article is abbreviated in The Journal. The complete article appears in the Transactions of the Section and in the author's reprints.

The use of disparate words will lessen the errors arising in this way, but the apperceptive factor is still to be considered. Words will be grasped in accordance with the hearer's familiarity with them, and one's familiarity with different words will vary with age, training and education, profession and environment. Moreover, the auditory value of words differs considerably with the letters or elements of which they are made up. O. Wolfe, who made a detailed study of the elements of speech, came to some rather surprising conclusions with regard to the hearing distances for different letters. Vowels are heard much better than consonants, and, therefore, for a given word the vowel is the index of the range or hearing distance for that word. The extremes of distance are illustrated in the statement that a as in "father" is heard over 250 meters, while aspirate *h* is heard less than ten meters. Sibilant *s* could be heard 175 meters, while lingual *r* is heard only forty meters.

The use of numbers or nonsense syllables precludes some of the disadvantages of using words and sentences, but they still have the chief fault of all voice or speech tests, namely, the lack of a uniform and comparable standard of intensity.

Agreeing to an approximate standard of intensity as acceptable for our purpose, however, we still have to object to the method of measuring auditory acuity by varying the distance from the source of sound.

Andrews made experiments by which he obtained the percentage of accuracy of hearing of individuals placed at different ranges who had a series of specially selected lists of numbers spoken to them, and reached the conclusion that, while there is a general decrease in audibility as distance increases, yet the decrease is neither constant nor uniform.

These inequalities were attributed to the reflection or absorption of the sound-waves, which differed for different parts of the room. As it is impossible to avoid these acoustic phenomena in any ordinary testing-room, we must be prepared for such a source of error in all conclusions based on the correlation of auditory capacity with distance.

To mention finally another source of possible error in testing with a loud or even ordinary conversational voice, it must not be forgotten that, if one ear has still good hearing, it is impossible to eliminate it completely in the test. Though held tightly closed with the finger, or with a wad of cotton, it participates in the hearing. There is the likelihood, therefore, of attributing to the ear tested a degree of audition which it does not really possess, but which has, in fact, been exercised by the other or normal ear.

WHISPER

The use of whisper for testing audition has advantages and partly avoids certain of the errors of conversational speech. It is more satisfactory for testing unilateral deafness as the unaffected ear is less likely to take part in the hearing. We can also come nearer with whispered speech to securing a uniform standard of intensity. This we do by following the instruction to utilize for our whisper test the residual air of the lungs after a forced expiration. It is likely too that the acoustic properties of the room do less to invalidate the estimation based on distance than in the case with loud speech. These are all advantages, relatively speaking, for the faults persist, though in less degree.

The absence of a uniform intensity is exemplified in the distance given as the normal hearing distance for whispered speech by different observers. They vary all the way from the estimate of Jasskau of ten or twelve meters for words and fourteen or fifteen meters for numbers, up to the estimate of thirty-five to forty meters given by Matte and Schultes.

We all realize how the result will be influenced by the acoustic properties of the room and its freedom or not from disturbing noises. In a room that looks on the street, the range of hearing will be materially reduced.

The quality and intensity of the constituent elements have been found to differ for whispered speech no less than for the loud voice. Quix, who has investigated this subject very thoroughly, has divided whispered speech into zones of pitch represented by the low, the high and the mixed zones. For the purpose of testing audition he finds it necessary to employ certain groups of words, which are what he calls isozonal and equi-intensive, for he finds that one group differs considerably from another in the distance at which the words are heard by the same individual. So that it appears that while whispered speech has advantages over the ordinary conversational voice as a means of testing hearing, it still falls short of being an accurate and reliable method.

THE WATCH

With regard to the watch, the committee of the Bordeaux congress says:

> "Notwithstanding that it has not been possible to obtain from manufacturers a type giving about the same tone and having the same intensity, its employment is so convenient and the indications furnished relative to the auditory perception by the bony route so valuable that we believe it should be maintained as an acoumetric measure until we possess an instrument more exact.

Andrews says that one may hear the watch at a considerable range and yet be relatively deaf for speech and vice versa, for the ratio between the range of hearing for speech and that for a single tone of noise is not necessarily constant even in the same individual. This is an objection which can be equally urged against all tests which are confined to the estimation of hearing of a single tone or click or involve the perception of only a restricted portion of the basilar membrane.

In employing a watch as a test faulty technic may lead into erroneous results. A watch will give a sound of greater or less intensity depending on whether it is open or closed, nearly run down or newly wound up, whether it is held free or against the palm of the hand, and depending on its relation to the wall or other reflecting surfaces.

It has seemed to me that erroneous results attributable to the psychic element plays a greater rôle in the watch test than in any others. The watch click is a familiar one of such a rhythmic character that when it has just been heard, one can very easily imagine that he continues to hear it, thus deceiving both himself and the examiner. One will obtain results that differ greatly according to whether the watch is gradually removed from the ear until it attains the extreme range of hearing, or whether one follows the contrary course of beginning outside of the range and gradually approaching until the threshold of excitation is attained.

THE ACOUMETER

Many acoumeters have been designed, all aimed to present a method which might gain universal approval and adoption as a uniform method of auditory mensuration. The only one that has approached success in this ambition is that devised by Politzer. In this instrument one endeavors to assure a constant and uniform intensity by the regulated extent of the fall of the hammer on a metal cylinder. The Bordeaux committee on acoumetry recommends a little different method of using from that which is recommended by Politzer and which has been the method in general vogue. Instead of raising the striker at the end of the index finger to let it fall again, they advise letting it hang freely, causing the striker to take a swinging movement such as one uses in ringing a bell.

The objections to the acoumeter are very much the same as those to a watch, and one is liable to fall into many of the same pitfalls and errors in using it to measure audition.

Neither uniformity of intensity nor of pitch can be relied on in the different instruments which one finds in the shops, and besides many inaccuracies necessarily result, as I have pointed out in speaking of the speech tests, in which an attempt is made to correlate auditory power with the distance between the subject and the examiner. Furthermore, the click of the instrument is so loud that it is impossible to eliminate a normal and fairly well-hearing ear, and it is not applicable, therefore, in unilateral deafness.

TUNING-FORKS

The tuning-fork as an instrument of well-defined pitch and of relatively pure tone would seem to be the ideal one for testing the auditory functions. Its harmonics are few and far removed from the fundamental and generally die out quickly. They can be constructed to produce notes below the usual inferior limit and from there through the whole range upward to the highest perceptible tones. Nevertheless, by reason of the unlike intensity of forks of different pitch, we find that insurmountable difficulties arise in an attempt to apply them for either quantitatively or qualitatively testing audition.

In the deepest tones it is very difficult to get a satisfactory instrument. The vibration originating from within and without the prongs have opposite phases, which tend to produce interference. The forks, therefore, in their low pitches are so feeble that they must be held very near to the ear to be appreciated. As Politzer stated, the effect is to produce a sensation which may be mistaken for sound and give misleading results.

In employing tuning-forks to test the hearing, one attempts by various methods to get some basis for the estimation of the intensity. Three ways are possible: (1) to attempt to get a uniform initial intensity by using a uniform physical impact; (2) to calculate the intensity from the amplitude of the vibration; (3) to infer the intensity from the duration of the vibration.

One may either employ the maximal strike in setting a tuning-fork in vibration or secure a uniform intensity by a device such as that of Lucae. This consists in a hammer attached to the prong of the fork by means of a spring. It must be remembered in using tuning-forks that the more forcible the strike the greater the harmonics which tend to cover the fundamental tone. It is best that the fork be struck gently with a covered hammer and near the middle of the prong if one would eliminate as much as possible disturbing overtones. With regard to a uniform initial physical energy, it must be understood that even though this could be satisfactorily secured not much is gained, because the effect is different with each fork and the intensity must be estimated by varying the distance on counting the time of vibration, methods both of which are open to serious objection on their own account.

With regard to the estimation of sound intensity by means of amplitude, there are different opinions, and doubt is expressed of the validity of the claim of a simple relation existing between the two. It is generally asserted that sound energy is in direct proportion to the square of the amplitude, but this is denied by some authors. At any rate it is possible to estimate intensity from amplitude only in forks of low pitch; above the second octaves amplitudes are practically indeterminable. Ingenious optic methods of determining amplitudes have been devised by Gradenigo, Bonnier and Ostman, but they are similarly applicable only to forks of low pitch.

The third method of using tuning-forks, by duration of perceptible vibration, is the one most commonly employed. A serious arithmetical mistake is made, however, in stating auditory power in terms of duration, because the loss of intensity is not directly proportionate with time and is different for forks of different pitch.

Deep tuning-forks vibrate for a long time with a feeble intensity which diminishes slowly, while forks of high pitch vibrate a short time with great intensity at the beginning which rapidly diminishes. Bezold, Edelman, Gradenigo, Quix, Struycken, Dundas-Grant, Schmieglow and others have been at great pains to establish for the different forks their curves of decrement, but the calculations on which they are based are complex, and there is no agreement as to results.

After all, according to Quix, duration curves are determinable only for tuning-forks which test the sensitive zones of audition; "beyond these," he says, "one falls into the domain of hypothesis."

AUDIOMETERS

We have discussed all the methods of measuring auditory acuity which are in common usage, but, in addition to these, other methods have been proposed and certain special instruments devised for carrying them out. But none have so far been sufficiently free from all objection to gain general recognition or adoption.

The term "audiometer" has been arbitrarily applied to that type of apparatus which is placed at a fixed distance from the subject, and in which, instead of varying distances, certain special arrangements are provided for varying the intensity of the sound by increasing or lessening the physical energy which produces it. It is indispensable, of course, to be able to start with an intensity below the threshold of normal hearing and to raise it to reach the threshold of the very deaf, and it is essential that the energy be of a kind that can be readily measured in all its gradations.

Some of the earliest instruments designed to measure audition were of this type. Wolke, in 1802, employed a metal hammer falling from different heights on a sonorous metal plate, and the same principle is utilized in one of the latest audiometers, that of Toulouse and Vaschide, who substitute for the hammer drops of water, which are let fall from different heights.

Itard, in 1842, measured hearing by the strike of a small spherical mass, suspended like a pendulum, which could be made to strike a circle of copper from different points of removal. The distance of the swing was indicated on a dial which was therefore considered a measure of auditory power.

Again employing this principle an instrument has been very recently proposed by two Italians distinguished in this branch of otology—Stefanini and Gradenigo. The use of electricity to vary the physical energy of the sound has been attempted by several authors, the most notable being the audiometer of Hughes and that of Seashore.

The chief difficulty with instruments of this type, if they are intended to secure universal adoption, is that it is not possible to realize uniformity in the different examples; their chief defect consists in the fact that they test but a restricted area of the cochlear field.

I have been experimenting recently at the government Bureau of Standards with a special machine which enables us to test the auditory function over a fairly wide area, namely, from 60 vibrations per second up to 3,000 per second, conducted to the ear by means of a sensitive telephone. An alternating current is passed through the primary of a variable mutual inductance whereby it can be readily varied in intensity. The different gradations of intensity can be accurately measured. I am thus able to produce sounds of varying intensity as well as of varying pitch fairly free from harmonics and thus combine, as we believe ought to be done, the qualitative and quantitative methods.

I have not progressed far enough as yet to feel justified in establishing any definite proposition, but I feel that such a method of testing audition embodies the right principles and will, if it can be simplified, become eventually the method of auditory mensuration *par excellence.*

CONCLUSIONS

From this general review of the chief methods of measuring auditory acuity, it is very evident that, as at present employed, they fall very short of the perfection greatly to be desired. They are both defective and deficient; no one of them is equal to all the demands of a complete acoumetry, and in what they attempt they are erroneous and easily lead to faulty interpretations.

The difficulties with which we have to contend are of two kinds, those which arise from the nature of the function being explored, and others connected with the various tests themselves and the manner in which they are conducted.

Strictly speaking we cannot really measure auditory sensation at all, because it is not a quantity divisible into equal units. We arrive at estimation of the power circuitously by measuring the energy employed in producing a given sensation, on the ground that auditory power is in inverse proportion to the intensity of the stimulus. We take as the criterion or standard of measure the lowest energy which we find is needed to produce just an appreciable perception of sound. This we call the liminal value, or from the standpoint of the ear, the threshold of excitation.

As we are obliged to depend on the interpretation and response of the subject, results will vary with degrees of intelligence and especially of aptness and attention. In testing with speech, for example, in which case the apperceptive faculties play an important rôle, education, training and environment greatly influence the response. Expectation and suggestion are psychologic factors which may vitiate the validity of tests otherwise carefully carried out, and in children it is necessary to eliminate as far as possible fear, nervousness and anxiety.

In some recent experiments I have shown that the ear by being continuously exposed to sounds readily shows fatigue which, of course, markedly lowers the threshold of excitation. This was found to occur with greater readiness with sounds at the two extremes of the tonal scale, but especially with those of the upper limit. It has been proved that general fatigue of the body will lessen the acuity of the senses—including that of audition.

With regard to the tests themselves, there are many and various sources of error. These should be well understood and carefully borne in mind, if we would avoid the fallacies of too implicit faith in their accuracy and reliability. Of all the sources of error the one which is most carefully to be guarded against is that of depending on distance as a reliable means of estimating sound intensity. In the first place, if there is a relation existing at all it is not a simple one, as might be inferred from the common practice of expressing auditory acuity by a fraction in which the normal hearing distance is taken as a denominator and the distance at which it is heard as the numerator.

The fact is the intensity of sound diminishes with distance geometrically and not arithmetically. Suppose, therefore, a loud watch which can be heard normally at 100 inches is heard at only forty, individual hearing power is not correctly expressed as 40 per cent., but as 16 per cent.; while if the patient hears at only thirty inches his hearing acuity, instead of being 30 per cent., is really reduced to 9 per cent. But, unfortunately, when distance is used as a means of arriving at the intensity of the stimulus, the law of geometric diminution is upset by other disturbing factors. The absorption and reflection of sound-waves, the influence of extraneous noises and the participation of the other ear in tests made with loud sounds, especially when the latter are of high pitch, may each, singly or jointly, upset all calculations. Errors flowing from such causes enter especially into the commonly employed tests made with the tuning-fork, the watch, the acoumeter and speech and, therefore, seriously affect the validity of the results which are obtained.

The errors arising from the lack of a uniform initial intensity are encountered in those tests in which this is depended on. It is one of the drawbacks in the use of the human voice, the intensity of which can be only roughly gauged, and differs even with the choice of vowels and their arrangement, and also in the use of the tuning-forks whose intensity must be estimated by calculations that are complex and faulty. The presence of harmonics is a bad fault in many instruments used in acoumetry. They tend to cover the fundamental tones and so lead to erroneous conclusions.

Nearly all the tests which are in general use are open to the objection that they apply to only limited portions of the whole auditory field and cannot therefore be regarded as giving a complete measure of auditory power. It is this that explains the observation which has been frequently made that a person may seem to have a good hearing for the watch and at the same time have great difficulty in hearing speech.

Tests used with the idea of covering a great part of the auditory field, including the upper and lower limits—the so-called qualitative tests—are often applied without regard to the function of intensity. As I have pointed out, the limits of sound perception might be extended and apparent hiatus disappear by merely employing greater intensity. It might be useful to know the amount of intensity necessary to get the threshold of excitation for different notes of the scale.

A general survey of the subject of auditory mensuration leads to the inevitable conclusion that there is great need of a system that will meet the exacting requirements of otologic purposes.

The ideal instrument for testing audition, from an otologist's standpoint, would be one capable of producing all the notes of the scale, from the highest to the lowest, in pure tones free from harmonics and capable of giving these notes in intensities readily measurable and varying from a point below the threshold of excitation of the most sensitive hearing up to a degree necessary to awake sensation in persons suffering from the most profound deafness.

Moreover, in order that such an apparatus may deserve universal acceptation, it must be possible to construct as many others as are wanted of the same type, each constant for itself and precisely similar to the others. It is only then that we can hope to make it available for a uniform notation comparable among different observers.

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TONSILLECTOMY BY THE SLUDER METHOD

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It is a matter of pride to us that, though total removal of tonsils has been advocated and occasionally practiced for decades, laryngologists within the last dozen years have established enucleation in capsule as the operation of choice and clearly defined the indications for it. As a result of their effort, with its leadership in America, general practitioners and laymen alike are fast coming to demand this procedure. Quick to appreciate its value, they are equally alert to detect faulty work and ready to condemn its author.

We will all admit that enucleation is being well done by sharp or blunt dissection, by the aid of scissors or knives and forceps of various designs, in most of which combinations the snare figures prominently, and that the performance of tonsillectomy will by any method demand much study and practice. On the other hand, we must concede that there is much bungling work being done to discredit legitimate tonsil surgery and that the question of how tonsils can best be removed is still an open one.

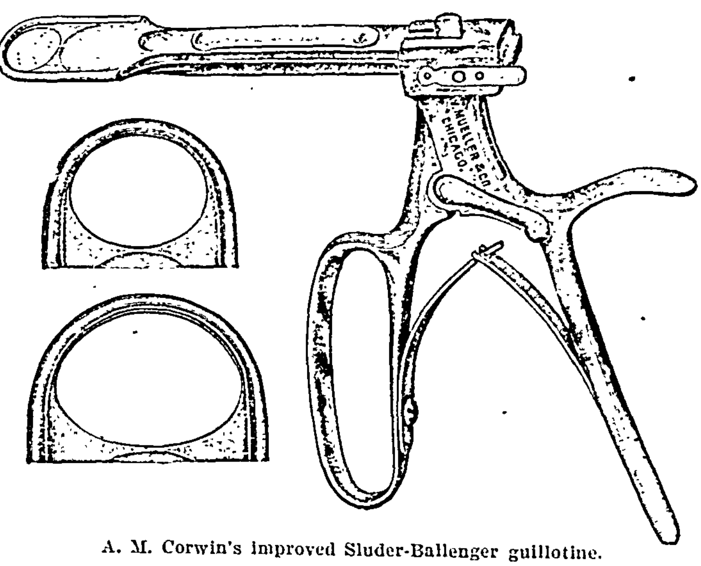
It is opportune, therefore, to emphasize the value of an operation with which you are all more or less familiar, but which, in spite of its merits, has not yet received the recognition that is bound, I believe, to place it foremost of all methods for tonsil removal.

The large percentage of unsatisfactory results following the operation on the tonsils by use of the guillotine has done much to bring discredit on this operation. When, therefore, Dr. Sluder advocated the use of this instrument, modified in certain particulars, for the operation of tonsillectomy, most of the men doing this work were not prepared to accept offhand his statement regarding the effectiveness of his operation.

The clear descriptions of the Sluder technic make it unnecessary to dwell on it here. The essence of this new idea is that the tonsil, when scooped up by the ringed margin of a fenestra in one end of a stout shaft, introduced below and behind the gland, pressing it upward and forward and outward toward the rigid alveolar eminence of the jaw, can be put entirely through this opening, especially if counter-pressure is made on the tonsil with the finger inserted in the mouth and applied to the outside of the palatoglossus. When thus put through the fenestra the gland can be quickly separated from its attachments outside the capsule by guillotine, pushed as with Dr. Sluder's instrument and its modifications, or pulled as with the ring guillotine suggested recently by Dr. Jennings of St. Louis, or with Dr. Beck's snare or those of others, or severed by scissors or knife. One may do this operation by utilizing the ring in the handle of a strong pair of forceps and a snare.

In view of the simplicity of this method it seems strange that the guillotine was not used for tonsillectomy long ago.

I would emphasize several points of technic. First, it is essential to keep the shaft of the guillotine oblique across the buccopharyngeal cavity, with the ringed end pressed with sufficient force well below the lower extremity of the tonsil to insure the presence of the entire gland in front of the ring as it is brought upward and forward. Secondly, the importance of pushing the last vestige of the gland through the fenestra by judicious massage with the fingers is fundamental. To make sure of complete dissection — this is the key. Thirdly, the blade should not be too sharp, lest it unduly buttonhole the capsule and slice the tonsil itself. A sharp blade may be effectually blunted by taking off its edge with any metal object, care being taken that the knife margin accurately fits the ring against which it is to be thrust. Neither should the blade be too dull, since it requires undue leverage to force it home, and it does not dissect so well. The matter of hemorrhage, as between the use of sharp or blunt dissection, is, in our experience, negligible, bleeding in any event being controlled according to indications. Fourthly, after final pressure on the blade, the lingering attachments of mucous membrane and fibrous shreds should be severed with the finger so that the guillotine comes away easily without dragging on the tissues; and it always holds the removed tonsil in its grip, necessitating no use of forceps.



A. M. Corwin's improved Sluder-Ballenger guillotine.

As an adjunct of this method, which has become an essential part of my technic for two years, I wish to commend the routine use of a pair of tonsil hemostats, of which there are several forms on the market. This one of my own design is simple, quickly adjustable and when in place is out of the way. The patient being asleep on his back, as soon as the first gland is removed, which takes but a few seconds, one of the hemostats is applied, immediately reducing bleeding to a minimum and allowing the removal of the opposite tonsil without delay in a pharynx relatively bloodless. Twenty-five per cent. tincture of iron in glycerol (glycerin) has been used on the pad, and this alliance of stypsis and pressure has reduced the total loss of blood in my cases to a very small amount. In more than fifteen hundred tonsillectomies none have demanded attention from secondary hemorrhage, which is more than I can say for my previous work.

Incidentally, I find most satisfaction in anesthetizing all patients, young and old, with gas and oxygen in the hands of an expert, rather than with ether, chloroform and ethyl chlorid; in this regard I have been fortunate, and shall never again use any of the latter if the former can be had. This gives a greatly shortened period necessary for total manipulation, four minutes usually covering the whole procedure from the time the patient is wheeled into the operating-room until he is wheeled out on his way to bed. If needed, however, this anesthesia may be extended as long as desired.

The added security appeals to the laity as well as the surgeon. The value of the oxygen safety-valve is beyond question, and is a source of critical comfort to the operator in handling those occasional patients who do not take any anesthetic well. The relative absence of nausea and prostration after operation also commends this combination.

It is my mature judgment, based on large experience, that the Sluder method is applicable to all cases except those rare ones in which incomplete or mutilating measures or inflammatory processes have left the parts bound in a network of rigid, unyielding scars with little tonsil tissue present. Here judgment will advise the use of knife or cautery. Ordinary stumps and buried glands surrounded by adhesions, whether large or small, are easy victims to a skilful use of the method in question.

It has been asserted that no purely mechanical device can perform this dissection. This hypothetic objection is disproved by the experience of many who have done the Sluder operation extensively and are its ardent advocates.

A second objection, by Dr. Otto Freer, assumes that "to squash chronically septic tonsils through a powerful ring will necessarily force germs into the lymph-channels, especially if a concealed chronic peritonsillar abscess exists." He adds, however, that "considering the great amount of blunt tonsil enucleation being done, serious consequences are surprisingly rare, but are sure to be encountered in a large series." This is purely fanciful. Ample observation does not justify it. Such a dire effect has never occurred in my own extensive experience, nor has it been reported, so far as I know, by any of the dozens of expert operators who have used this measure. How unlikely such an occurrence is, even from a speculative point of view, follows from the fact that the capsule and inflammatory wall of a concealed chronic abscess are firm fibrous barriers, much more impenetrable than the tonsil itself, so that actually when the structures are pressed on from the outside, behind the anterior pillar, the adventitious contents of the organ tend to escape in the line of least resistance through the crypts into the faucial cavity. This is what takes place, the tonsil often being literally turned inside out.

Brains and experience are as much factors in the successful performance of the Sluder method as in any method. The size of the fenestra is important in this connection—the larger the tonsil, the more flabby or long in its vertical measurement, especially in adults, the more the advisability of employing the guillotine with the largest opening, which wholly eliminates even the imaginary danger of undue mechanical violence referred to.

Dr. Freer again has publicly called attention to the value of preserving the plica triangularis with which to line the muscular cavity from which the tonsil has been dissected. This structure, as convincingly pointed out by Dr. G. Fetterolf,[1] is a part of the tonsillar capsule. There seems no more reason for preserving it than for preserving the rest of the capsule, which to-day we aim to remove. Operative results of its removal sustain the wisdom of it. How many, in truth, operating by ordinary dissection, are preserving this plica and carefully stitching it to the surface of the pillars and superior constrictor in order to give this surface a covering of epithelium? Unless it is so held in place, how much good would it do to leave it?

Finally, much has been said about the cutting or tearing of the anterior pillar and dragging away of muscle fibers. I have here about a quart of miscellaneous tonsils for your inspection. If you find clinging to them an essential part of structures that should have been preserved, I should like to have this pointed out. I am only sorry that I have not the corresponding throats here from which they were taken in order to show the clean and perfect results that were attained clinically.

The Sluder guillotine has been dubbed by Dr. Freer a device of fear and incompetence to be used by those who cannot do scientific surgical dissection. Says the critic: "Those advocating such mechanisms always have in mind a typical tonsil for which the implement is constructed, and ignore the many changes produced in the tonsil and its surroundings by pathologic conditions, which make the operation of tonsillectomy one requiring great versatility." The attack, however, assumes that little judgment, skill or knowledge of anatomy is needed to apply the principles of the operation laid down by its discoverer. The facts are that many who are skilled in the employment of knife or scissors and snare have laid these by for this up-to-date guillotine as a better measure.

With scant courtesy toward its author, some have suggested that the instrument should be called the Mackenzie-Sluder, as if to hyphenate both names and honor, forgetting that no originality is claimed by Dr. Sluder for the guillotine idea, but rather for a totally new use of a very old device. By inference, no surgeon employing a scalpel should be entitled to fix his name unqualifiedly to any new operation, because, forsooth, the knife was first used by Sir Daggerous Flint, of the stone age.

It would not be surprising if the Sluder method were a failure in the hands of any one who relies for its performance on the cheap, grotesque imitations of Sluder's guillotine which are now on sale by certain instrument houses. There is no excuse for these misrepresentations in metal when the original was so carefully described by its author. There ought to be some method of rigid standardization among manufacturers of instruments marketed under definite titles.

15 East Washington Street.

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[1] Fetterolf, G.: Anatomy and Relations of the Tonsil in the Hardened Body, Am. Jour. Med. Sc., 1912, cxliv, No. 1.